ADVISORY

DEPARTMENT OF THE IMPERIAL COLLEGE

OF TROPICAL AGRICULTURE.

IMPERIAL MYCOLOGICAL
6 DEC. 1939
INSTITUTE

REPORT

ON THE

DEPARTMENT OF AGRICULTURE

ST. LUCIA,

1938.

ISSUED BY THE COMMISSIONER OF AGRICULTURE

[Price Sixpence.]

ST. LUCIA.
PRINTED BY THE GOVERNMENT PRINTER AT THE GOVERNMENT PRINTING OFFICE,
1939.

FORWARDING DISEASED SPECIMENS FOR EXAMINATION.

PLANTS.

A few fragments of a diseased plant are of practically no value for scientific investigation. Sufficient material should always be sent so that the primary cause of the trouble may be located.

Full particulars should be given as to the nature and extent of the damage done, the part of the plant attacked, the nature of the soil, drainage, the prevalence of the disease, when it was first noticed, and whether any similar kind of disease has previously been observed in the neighbourhood.

Specimens of portions of plants attacked by fungi may be sent green, packed in a well ventilated box if the time taken for delivery is under 24 hours, but if delivery takes a longer time, all leaves or soft fruits should be placed in a bottle or corked tube containing a solution made of one part rum or methylated spirit and two parts water. As many stages of the disease as possible should be sent, with notes as to the nature of each stage.

All specimens should be accompanied by detailed particulars of the nature of the disease and shall be addressed to :—

THE DEPARTMENT OF AGRICULTURE,
CASTRIES.

INSECTS.

Observations and specimens of economic importance or otherwise will always be gladly received. The following directions should be observed in this respect :—

Living insects should be packed with a supply of the plant on which they are found feeding and the box should have some small holes pierced for the purposes of ventilation. These should be carefully packed in such a way as to prevent their becoming crushed in transit.

If it is desired to preserve specimens they should be put up in bottles with tightly fitting corks. Methylated spirits, diluted rum, etc., make excellent preserving fluids.

Scale insects, etc., should be forwarded on the portion of the plant on which they are found.

If in doubt as to the best method of forwarding specimens, a letter should be sent asking for instructions and stating full details.

In all cases full particulars should be forwarded as to the nature and extent of damage done, along with any other important points that may have been noticed.

All specimens should be addressed to :—

THE DEPARTMENT OF AGRICULTURE,
CASTRIES.

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COLLEGE OF TROPICAL AGRICULTURE.

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1939.

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(1) From 5 9.38. (2) To 31.5.38. (3) From 12.6.38. (4) To 15.1.38. (5) From 16.8.38. (6) To 31.7.38. (7) From 2.5.38. (8) From 1.1.38.

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SAINT LUCIA.

Report of the Department of Agriculture for the year ended December 31st, 1938.

SECTION I. AGRICULTURE IN THE COLONY.

1. Weather Conditions and Agriculture.

This was again a year in which abnormal weather conditions were experienced, culminating in the worst storms, floods and landslides within living memory and probably unprecedented in the history of this Colony, with the tragic loss of many lives. Considerable damage and loss to property and crops occurred as a result of flooding in the low-lying areas, and from landslides and erosion at the higher elevations in all parts of the Colony, although the southern part of the Island did not suffer to quite the same extent.

Planting operations were seriously retarded and transport of produce was rendered impossible for some time on account of the condition of most of the roads and bridle paths, with consequent heavy losses to all connected with agriculture, banana growers particularly. Emergency measures were organised to meet the situation; the transport of food supplies and produce to and from the windward coast was carried out as far as possible by the sea route until normal conditions were restored some six to eight weeks afterwards. Rainfall distribution was again irregular, especially during the second half of the year; no less than 43·07 inches falling during November alone.

Intermittent heavy winds occurred during the year, more particularly from June to August; but no gales of hurricane force were experienced.

A more detailed analysis of meteorological conditions will be found appended to this Report.

2. General Conditions and Progress in the Chief Industries.

1. THE SUGAR INDUSTRY.

A decline in price average was unfortunately experienced by the sugar industry during the year, export market quotations being approximately £8 4*s*. per ton as against £9 5*s*. per ton recorded in 1937.

Production increased to a record figure, a total of 79,027·8 tons of cane being ground by the four factories, yielding 8,611·3 tons of sugar, as compared with 69,871·5 tons of cane and 8,029·2 tons of sugar in 1937. The extraction ratio was however somewhat higher than last year due to unfavourable ripening weather and rainy spells during the reaping season, which commenced in late February, and continued until April—May. The ratio was 1 ton of sugar from 9·17 tons of cane, that for 1937 being 1 ton of sugar from 8·7 tons; the highest and the lowest extractions were 1 ton of sugar from 9 and 9.6 tons of cane respectively. The yields of cane were good, factories averaging approximately ·28 tons of cane per acre, a rather higher average than last year.

The standard wet area cane B.H. 10(12) continued as the most suitable variety, while for the dry areas B. 2935 has proved most suitable, and in this connection it is of interest to record that even with little or no work done at

Vieux-Fort prior to the sale of the estate the results obtained from B. 2935 were noteworthy. The area under cane was estimated at 4,000 acres, of which 2,390 acres were reaped by the four factories exclusive of contributors, metayers and syrup cane.

As the paramount industry of this Colony, it is very satisfactory to be able to record the progress and improvements which continue to be effected in all stages of production.

Molasses and Rum.

A corresponding increase in the production of molasses occurred, and the export of molasses represented a further increase but prices were not maintained as will be seen from the table below. The production and export of rum both reached record figures, production representing a 13·5% increase over the previous highest total for the past ten years, that of 1929. Although the bulk of rum manufactured was consumed locally as usual, a very considerable increase in export is recorded.

The Barbados agreement, details of which were given in last year's Report, tended to stimulate interest in the production of fancy molasses which continues to be centered around two estates. Market conditions improved slightly and the crop was disposed of without difficulty, but there is no doubt that a high standard of product will have to be maintained to find a ready outlet in future.

The following schedule shows comparatively the production and export of sugar manufactures for the five-year period 1934-38. An increase of 31·7% in export value above the average for the ten-year period 1929-38 is recorded; the production increase was 36·2% for the same period.

Year	Tons of Cane*	Sugar.			Molasses.			Fancy Molasses.			Rum.			Exported Total Value Sugar Products.
		Produced tons	Exported tons	Value £	Produced gallons.	Exported gallons	Value £	Produced gallons	Exported gallons	Value £	Produced gallons	Exported gallons	Value £	£
1934	...	5,494	4,730	39,396	194,000	...	...	†	23,080	1,431	25,239	3 1/10	3	40,830
1935	67,197	7,286	6,080	48,377	256,900	140,639	1,021		28,264	1,380	31,408	...	...	50,778
1936	70,847	8,118	7,707	60,358	280,951	82,526	610		24,602	522	34,551	4,091 2/3	649	62,139
1937	69,871	8,029	7,225	62,313	237,484	97,135	854		46,881	2,347	33,828	2,427	243	65,757
1938	79,027	8,611	7,806	64,711	254,190	122,984	1,363		27,294	1,723	44,512	10,251	1,186	68,983

* Production from four Factories only and excluding canes for syrup, &c.
† Figures not available.

Difficulties in the Industry.

There is nothing of direct importance to be recorded under this head during the year under review, except perhaps to mention the visit of the West India Royal Commission to the Colony during December, for the purpose of investigating economic and social conditions generally.

Mention might be made also of the arrival of the resident manager, field staff and factory staff of the Barbados Settlement Company Ltd. during the first half of the year to commence operations at Vieux-Fort. Considerable progress had been made up to the end of the year.

Housing.

Good progress continues to be made in this direction in the principal producing districts, and although far from adequate for present needs, members of the Royal Commission were appreciative of the efforts shown.

2. THE LIME INDUSTRY.

Weather conditions for the crop during the first nine months of the year were favourable, irrigation being resorted to in the dry months where practicable, to the general benefit of the trees and crop production. Further

losses were sustained from the continued effects of "Root disease" and citrus weevils (*Diaprepes* spp.). The valuable research work being carried out by Mr. Fennah, Citrus Pests Entomologist, on these two major problems hampering the industry is described by him under the section dealing with entomological investigations.

The general setting of the early flowerings resulted in a fair crop of fruit from March—April, which continued satisfactorily until October—November when inclement weather conditions caused considerable damage.

A further decline in exports of lime products is recorded, the total export value being the lowest since 1932. Less favourable marketing conditions were mainly responsible for this, particularly in connection with green limes and lime oils; only raw lime juice showed any extra activity over 1937, and a growing feeling exists that the future of the lime industry will have to depend chiefly on raw lime juice and fresh limes.

The total exported lime crop of the Colony, calculated as barrels of limes, amounted to 28,294 barrels valued at £14,429 as compared with 32,048 barrels valued at £18,243 in 1937. The exported crops for the last ten years are shown below :—

Year.	Quantity barrels.	Year.	Quantity barrels.
1929 ...	34,483	1934 ...	45,000
1930 ...	42,844	1935 ...	38,189
1931 ...	50,339	1936 ...	22,569
1932 ...	44,762	1937 ...	32,048
1933 ...	44,019	1938 ...	28,294

The export production of the crop of the Colony for the five-year period 1934-38 is shown in the following table :—

Year.	Concentrated Lime Juice.		Raw Lime Juice.		Distilled Lime Oil.		H. P. Lime Oil.		Green Limes.		Pickled Limes.		Total Value £
	Quantity gals.	Value £	Quantity gals.	Value £	Quantity lb.	Value £	Quantity lb.	Value £	Quantity brls.	Value £	Quantity brls.	Value £	
1934	3,371	223	10,525	471	13,406	12,275	1,251	1,868	6,001	7,010	...	...	21,852
1935	1,080	45	29,613	854	10,264	9,673	1,504	2,517	6,619	8,035	...	...	21,124
1936	3,317	160	34,171	1,405	5,463	6,091	810	1,047	5,731	6,977	...	...	15,680
1937	1,109	60	11,350	602	11,305	10,187	2,106	2,946	3,537	4,420	26	28	18,243
1938	270	12	31,216	1,509	9,395	8,352	876	1,178	2,579	3,353	20	25	14,429

Conditions in the Industry.

To meet the anticipated increase in demand for budded limes, following on last year's experience when the entire production of budded plants in the several nurseries was exhausted, the number of plants raised during 1938 was practically doubled to nearly 10,000 plants, but unfortunately poor marketing conditions and lack of capital caused a general waning of enthusiasm for any extensive programme of replanting, with the result that the Departmental nurseries had a considerable carry over of budded plants at the end of the year. It is hoped that circumstances will improve sufficiently during 1939 to permit of a more general replanting programme being carried out by estate owners, and so help maintain the industry by replanting some portion of those areas which have been put out of production by "root disease" and weevil attack.

The unusually inclement weather experienced during November caused a great deal of damage to orchards; trees were uprooted by rivers and landslips, much of the crop was carried away and the trees took some time to recover from the waterlogged conditions.

The principal points of interest in the industry during 1938 are dealt with under their respective headings.

Green Limes.

Although the green lime crop was well up to average, marketing conditions continued unfavourable. The following table shows the local prices offering together with corresponding shipments of green limes for each month during 1938 :—

—	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Local Prices per brl.	23*s.*	20*s.*	18-20*s.*	22/6	18-20*s.*	12/6 to 15*s.*	12*s.*	12*s.*	9*s.*	12*s.*	15*s.*	15*s.*
Exports (brls.)	73	42	96	371	1,105	224	178	166	166	72	47	59
Value of Exports	£99	£51	£145	£566	£1,556	£270	£194	£169	£150	£69	£47	£62

Exports to Canada showed a welcome increase of about 31% over 1937, and it is to this market and that of the United Kingdom, which at present absorbs only a fractional amount of local exports, that the industry must look for future outlets. To this end the revision of the Canada—West Indies Treaty which is likely to take place during 1939 may prove of considerable benefit. Moreover, a carefully organised campaign is being conducted in the United Kingdom with a view to stimulating a demand for green limes. Mention should also be made of the formation of a St. Lucia Limes Association during the year with the object of co-operating with similar organisations in the other lime producing colonies, for the control and advancement of conditions in the industry as a whole, and for the ultimate affiliation with the West Indian Limes Association when formed. It is to be hoped that these efforts will combine to bring about a much needed improvement to the industry.

The United States market which has always been the largest dropped again by 50 per cent. There is little doubt that competition from Mexican and other limes will continue to be felt to an increasing degree in this market. As indicated in last year's Report, the Bermuda market is definitely limited and it would seem that it is receiving some attention from other producing colonies. Exports to this market were less by 62 barrels as compared with 1937.

All shipments were made on the f.o.b. basis, and an average price of about $6·24 per barrel was obtained. The following table shows the destination of exports of green limes during 1938, as compared with 1937 :—

Destination.	1937.		1938.	
	Quantity brls.	Value £	Quantity brls.	Value £
Canada	485	605	637	884
United Kingdom	24	31	8	11
U.S. America	1,983	2,566	973	1,385
Bermuda	1,034	1,211	972	1,093
Barbados	9	5	9	5
Martinique	2	2	...	...
Total	3,537	4,420	2,599	3,378
Decrease in 1938	...	...	938	1,042

Lime Juice.

A welcome increase in raw juice exports is recorded, principally to the United Kingdom market, which accounted for 22,472 gallons as compared

with 1,356 gallons in 1937. Exports to the Canadian market declined by some 10 per cent., but the United States market increased from 213 gallons in 1937 to 622 gallons in 1938. A small market was obtained in Bermuda.

Quotations on the London market ranged around 2*s.* 6*d.* per gallon c.i.f. for filtered juice.

Concentrated Lime Juice.

There would appear to be little future for this product which showed a further considerable decrease, a total of only 270 gallons being exported to the United Kingdom. Prices remained unattractive at approximately £5 10*s.* per pipe.

Lime Oils.

Lime oils were again the mainstay of the industry with distilled oil the principal feature. There was a slight decline in exports of distilled oil which amounted to 9,395lb. valued at £8,352, as compared with 11,305lb. valued at £10,187 in 1937. Exports of handpressed oil were 58.4 per cent. less than for 1937.

Quotations were rather lower than the preceding year, distilled oil averaging about 18*s.* per lb and handpressed oil 30*s.* per lb. The bulk of the oil is regularly marketed through the West Indian Lime Oil Sales Company, which organisation has had a very strengthening effect on the market. The storage and sampling service in connection with lime oil shipped by the St. Lucia Lime Oil Producers' Company Ltd. under the control of the West Indian Organisation mentioned above was maintained by the Department. No complaints were received by the Department concerning any shipments made.

Lime Skins.

An enquiry was received towards the end of the year from a Canadian firm for lime skins in brine, or in dried form. It is too early to say whether any business is likely to result for this new commodity, but it is understood that a fair volume of trade would be possible. No indication of prices has been made as yet.

3. THE BANANA INDUSTRY.

This industry is almost entirely in the hands of peasant proprietors and has made rapid progress during the past few years. Further progress is recorded during the year under review, as a result of which it has assumed the position of the third most important industry. Weather conditions were most favourable until November, and production would undoubtedly have far exceeded the estimate of 150,000 stems, had it not been for the excessive rains during November which caused heavy losses not only in production, but also to actual cultivations through landslips.

The St. Lucia Banana Association which controls the grading and shipment of all fruit, continues to render valuable service for the benefit of the industry. Regular fortnightly shipments were made by the steamers of the Canadian National Steamships as usual, though there was an increased amount of "shut-out" fruit (fruit purchased by the Canadian Banana Company, but not shipped owning to lack of storage space on board) during the season of peak production.

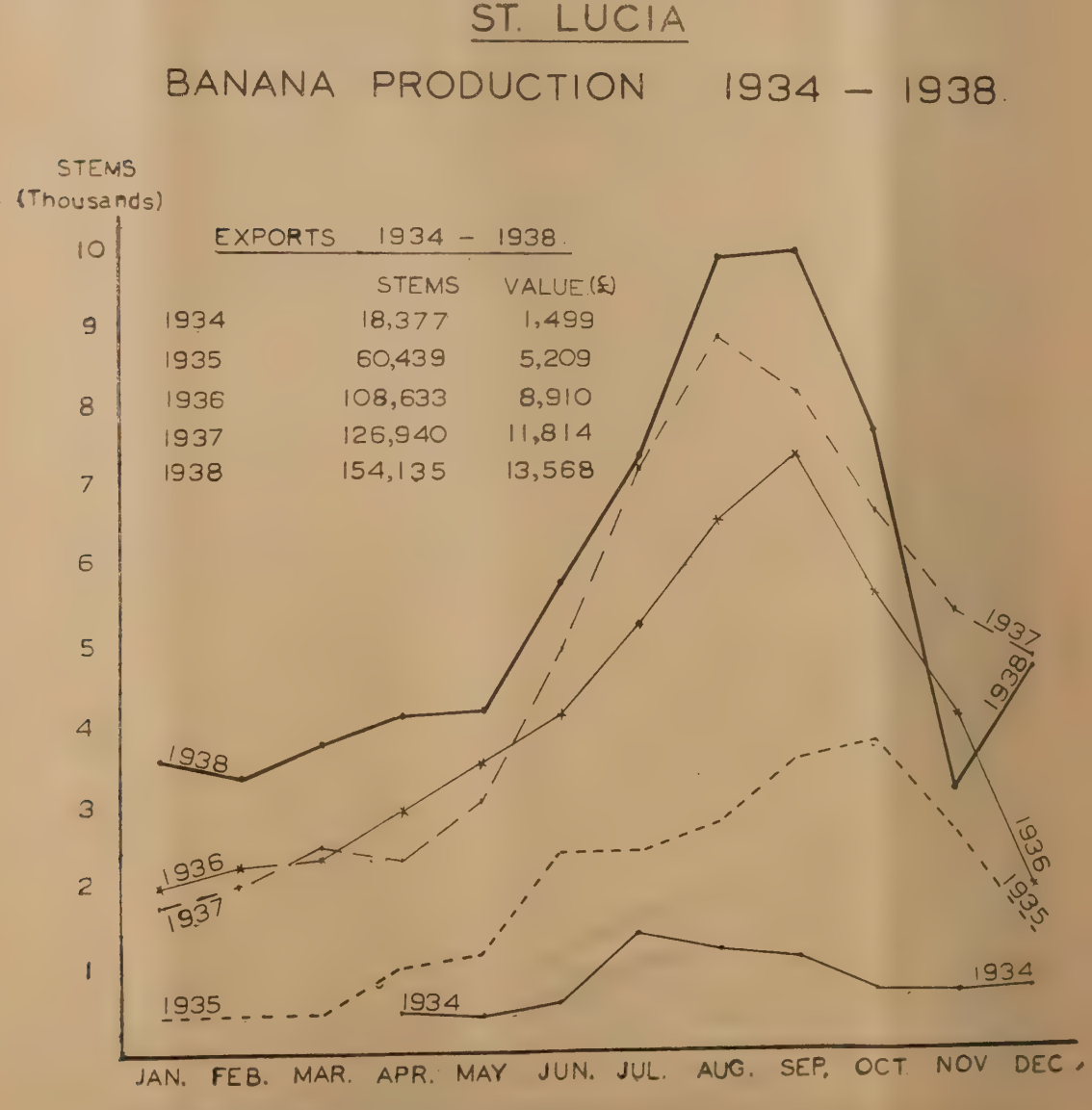
Actual exports amounted to 100,986 stems, which when added to those bought by the Canadian Banana Company and not shipped, give a total export production of 154,135 stems valued at £13,568, as compared with 126,940 stems valued at £11,814 in the preceding year. Export production for 1938 thus shows an increase of about 21.3 per cent., and an increase of nearly 15 per cent. in value over 1937. The following comparative statement of total exports from the British West Indies to the Canadian Banana Company during 1938 is of interest :—

Export Production—Canada Banana Company.

Island.	9s.	8s.	7s.	6s.	Totals.	Counts.	Per cent. Counts.
Dominica ...	29,714	22,138	13,780	—	65,632	53,207	81%
Grenada ...	59,517	27,988	18,800	—	106,305	89,908	84%
St. Lucia ...	40,441	38,412	16,848	—	95,801	77,724	81%
Trinidad ...	45,418	26,476	11,162	—	83,056	70,856	85%
St. Vincent ...	13,547	14,292	14,628	—	42,467	31,580	74%
Totals ...	188,637	129,306	75,318	—	393,261	323,275	82% Average.

Short Shipped		
Dominica	...	61,445
Grenada	...	29,976
St. Lucia	...	53,149
Trinidad	...	48,672
St. Vincent	...	32,804
		226,046

A graph appears below, as a means of illustrating the Colony's monthly export production to the Canadian Banana Company over the past five years :—



Monthly totals shown above have been obtained by dividing the number of shipments per month into the actual monthly exports.

The area under production at the end of the year, was estimated at 850 acres, some 64 acres less than that recorded during 1937, due to the November storm damage. Owing to the scattered nature of the gardens, often in inaccessible areas, these figures can only be a rough estimate, and while there is every reason to affirm that the estimated acreage of 1937 was fully maintained and probably increased during the 1938 planting season, later information may reveal a greater reduction in total area under cultivation than was originally calculated. Production for 1939, therefore, has been estimated at 80,000 stems.

The industry is still handicapped by inadequate transport conditions particularly during the period of peak production. Transport conditions became exceptionally bad towards the end of the year, and for some weeks were completely dislocated. Strenuous efforts were made to get the fruit into Castries. Reports subsequently received from the Canadian Banana Company, however, indicated that these latter consignments of fruit were not up to standard on arrival at destination, and this unfortunate position was rendered even worse due to a general tightening up by the Company of the export standard. The peasant has been very disheartened by these set-backs, but it is hoped that confidence will be restored in due course. The Department is fully alive to the necessity of giving every encouragement to this industry where practicable, representing as it does the only remunerative cash crop for the peasant for which there is an unlimited demand. Whilst on the subject of transport difficulties, it will not be inopportune to mention that the Banana Association is taking early steps to prevent the growing tendency by owners or drivers of trucks to carry passengers and other freight on top of the bananas! Some glaring cases have been observed, and it is intended to legislate against this practice as soon as possible.

Difficulties in connection with the satisfactory storage of fruit on the wharf at Castries immediately prior to shipment have arisen, owing to the expansion of the industry and the resultant inadequacy of space in the existing shed, especially during the peak period. The Banana Association has this matter in hand and an extension of the existing shed is contemplated.

The erection of a jetty at Micoud, which has received discussion in previous Reports, was not approved in the 1938 Estimates of the Colony, and the matter has now been deferred.

The following tables, compiled from returns furnished by the St. Lucia Banana Association and this Department are indicative of the position of the industry :—

1. *Export Production during 1938 to the Canadian Banana Company.*

Months.	9s.	8s.	7s.	Total.	Counts.	Percentage Rejects.
January ...	2,006	2,275	3,576	7,857	5,500	—
February ...	1,797	1,999	3,035	6,831	4,814	—
March ...	2,009	2,288	3,414	7,711	5,432	—
April ...	3,244	3,880	4,770	11,894	8,839	—
May ...	1,962	2,671	2,816	7,449	5,873	—
June ...	2,663	3,752	5,270	11,685	8,112	—
July ...	3,963	4,884	5,992	14,839	10,622	4·4
August ...	5,975	6,580	7,212	19,767	14,515	4·6
September ...	6,126	5,871	8,081	20,078	14,569	7·5
October ...	6,715	6,404	10,064	23,183	16,567	8·6
November ...	1,833	1,844	2,824	6,501	4,626	8·2
December ...	2,686	2,792	4,078	9,556	6,831	8·4
Totals ...	40,979	45,240	61,132	147,351	106,300	

2. *Estimated Number of trees and acreage of Bananas.*

District.	*Estimated No. of trees.*	*Estimated Acreage.*
Castries	16,800	60 acres
Dennery	56,000	200 ,,
Micoud	85,700	306 ,,
Vieux-Fort	3,100	11 ,,
Laborie	15,200	54 ,,
Choiseul	5,100	18 ,,
Soufrière	20,200	72 ,,
Canaries	19,100	68 ,,
Anse-la-Raye	14,300	51 ,,
Gros Islet	2,800	10 ,,
Total	238,300	850 ,,

4. THE COCONUT INDUSTRY.

The value of this industry declined by some 29% as compared with 1937, thereby falling to the position of fourth export industry of the Colony. Some plantations were affected by dry periods during the first half of the year, but pests and diseases were not evident to any extent; a few cases of Bud-rot were immediately dealt with. Scale insects were noticeable during the drier months of the year, but were not as prevalent as reported in 1937. Efforts to control these insects by the introduction of parasites, which have proved very successful in Trinidad, are described under Section II, Subsection V, Entomological Investigations.

Although coconut planting in new areas continues on a small scale in the Colony, there is not much more land which can be regarded as economically suitable for this purpose. Further interplanting of lime orchards with coconuts at the wider spacings has been carried out on a few estates to a limited extent.

Good average yields were obtained during majority of the year, but heavy losses were sustained by coconut growers during the exceptional rains of October—November when flood waters carried away a large number of nuts from the low-lying coastal plantations.

Market conditions were generally unfavourable, and the heavy freight rates on coconuts and copra (in common with other products) between this Colony and the United Kingdom are a severe burden on the industry. To illustrate this point, the following figures relating to expenses and freight on part shipment of coconuts to England have been obtained from a local firm of exporters. Owing to variations in market price, calculations have been made per bag (150 nuts) :—

1937.

	Gross Return.	*Freight.*	*English Expenses.*	*Total Expenses.*
829 bags	£593 6 6	£188 2 7	£92 6 5	£280 9 0
Per bag	14*s.* 3¾*d.*	4*s.* 6½*d.*	2*s.* 2¾*d.*	6*s.* 9¼*d.*

1938.

924 bags	£551 13 3	£237 18 4	£102 11 8	£340 10 0
Per bag	11*s.* 11¼*d.*	5*s.* 1¾*d.*	2*s.* 2½*d.*	7*s.* 4¼.

This represents an increase in freight charges of 13·3%, with a decrease in the price per bag of 16·5%.

Copra.

Prices were poor throughout the year averaging around £10 17 6 per ton c.i.f. London, with the result that only 306 tons of copra valued at £2,906 were manufactured, the corresponding figures for 1937 being 404 tons valued

at £5,335. Exports to Barbados accounted for no less than 71·6% of the total, the balance being divided between the United Kingdom and the Trinidad markets.

A scheme has been under consideration for some time by certain of the larger growers for the more extensive use of local copra for the processing of edible oil and lard substitute by one of the Trinidad factories, with a view to supplying the Colony's annual consumption of these articles. Such a scheme should be of much needed benefit to large and small coconut producers, and it is hoped that some decision will be taken early in 1939.

The following table shows the quantity and value of exported coconut products during the last ten years :—

Year.	Coconuts No.	Value £	Copra tons.	Value £	Total Value £
1929	295,983	1,032	359	9,878	10,910
1930	268,078	862	400	7,428	8,290
1931	367,350	1,178	498	5,869	7,047
1932	650,240	2,430	432	5,389	7,819
1933	1,199,808	3,527	542	5,167	8,694
1934	2,616,175	7,298	302	2,592	9,890
1935	2,814,965	7,632	215	1,871	9,503
1936	3,409,621	9,608	306	3,561	13,169
1937	2,993,422	10,476	404	5,335	15,811
1938	2,674,148	8,278	306	2,906	11,184

5. THE CACAO INDUSTRY.

In addition to unfavourable weather conditions during the latter part of the year, the prices offering for this product were far from encouraging, resulting in further neglect of cultivation and loss of interest in the crop. Some peasants near the sugar factories removed their cacao in order to plant sugar cane.

General neglect of cultivations together with unusually damp conditions during August which affected flowering, was responsible for a later crop than usual, and the heavy rains during the latter part of the year caused additional losses. Despite this, however, exports of cacao amounted to 6,198 cwt. valued at £8,332, as compared with 5,585 cwt. valued at £13,357 during the preceding year.

Local prices for estate cacao averaged around 20*s*. per cwt., and for peasants cacao 1½*d*. per lb. The average price obtained on the London market was around 30*s*. per cwt. c.i.f. for estate cacao, and 23*s*. 4 per cwt. c.i.f. for peasants cacao. The bulk of the exports were to Canada and the United Kingdom. Further details are shown in the table below :—

Destination.	1937. cwt.	1937. £	1938. cwt.	1938. £
Canada	2,659	6,514	3,169	3,839
Trinidad	1,464	3,442	...	...
United Kingdom	1,246	2,961	2,794	4,289
Barbados	180	340	235	204
U.S. America	36	100	...	...
Total	5,585	13,357	6,198	8,332

The following table shows the amount and value of cacao exports over the past five years :—

	Cwt.	Value (£)
1934	6,349	6,032
1935	5,605	6,042
1936	6,538	9,627
1937	5,585	13,357
1938	6,198	8,332

At one time cacao was cultivated by a large number of peasant proprietors, and when the importance of maintaining a permanent crop of this nature under local conditions of climate and topography is fully appreciated, the neglect which has manifested itself in recent years is to be regretted.

2. (b) Minor Agricultural Industries.

1. THE FRESH FRUIT TRADE.

The value of fresh fruit exported was somewhat lower than in 1937, namely £4,045 as compared with £4,424. The Bermuda market was again the largest outlet, accounting for 38·1% of the total exports. The Bermuda and Barbados markets are served by the regular fortnightly service of the Canadian National Steamships and other steamship services further facilitate supplies to Barbados, but the extent of both of these markets is limited and there would appear to be little likelihood of any considerable increase in the volume of this trade until such time as more regular services are available to the United Kingdom market. The fresh fruit industry is worthy of more encouragement, but such encouragement will be difficult until improved facilities are available. The following schedule shows the extent of this trade during the past five years :—

	1934.		1935.		1936.		1937.		1938.	
	Amount	Value £	Amount	Value £	Amount	Value £	Amount	Value £	Amount	Value £
Grapefruit crates	32	13	122	35	285	84	306	121	363	89
Oranges ,,	374	92	291	91	126	30	107	24	542	53
Mangoes ,,	7,881	1,372	6,556	1,567	8,046	1,619	9,591	2,032	...	1,900
Avocado pears ,,	2,245	389	3,857	709	3,336	504	3,960	623	...	509
Pineapples ,,	36	16	13	3	17	2	36	7	...	31
Miscellaneous ,,	...	1,917	...	1,752	6,758	1,894	...	1,617	...	1,463
Total ...	10,568	3,799	10,839	4,157	18,568	4,133	14,000	4,424	905	4,045

The values of exports to the main markets during 1938 were as follows :—

	Value (£)				
	Canada.	Bermuda.	U.K.	Other Places.	Total.
Grapefruit	31	45	5	8	89
Oranges	4	27	...	22	53
Mangoes	25	939	67	869	1,900
Avocado pears	...	507	...	2	509
Pineapples	...	27	...	4	31
Miscellaneous	...	...	...	...	1,463

2. VEGETABLE AND GROUND PROVISIONS.

There was a considerable reduction in the amount of pumpkins exported during 1938, principally on account of other producing colonies having interested themselves in the limited Bermuda market.

The inclusion of farine under this head, however, this year causes a slight increase in export values—1938, £685; 1937, £643. A welcome increase in the export of farine (mainly to Bermuda) during 1938 is recorded. Comparative exports were 1938—31,471lb.; 1937—13,262lb. The production of this crop could be greatly enhanced given increased attention to cultivation methods; although no actual measurements of yield have been taken it is fairly certain that they are not up to economic standard. Exports of other mixed ground provisions showed an increase over 1937.

The values of vegetable and ground provision exports during the past three years are shown below :—

	1936.	1937.	1938.
	£	£	£
Pumpkins	396	430	244
Plantains	63	76	85
Farine	103	108	214
Mixed	123	137	142
Total	685	751	685

Fresh vegetable production is seasonal and, for some months of the year, insufficient to meet local demands. There is an abundance of the more starchy vegetables or ground provisions such as cassava, sweet potatoes, yams, tania, dasheen, plantains and breadfruit (when in season from July to October). Of the fresh vegetables, carrot, turnip, lettuce, spinach, cabbage, tomatoes, beans, cucumber, egg plant, okra, beetroot, onion and cauliflower are cultivated to a varying degree, but their production could be considerably increased with advantage for more general consumption. Onion cultivation, especially, should receive more attention, since recent importations of this vegetable have been unnecessarily high.

3. OTHER CROPS.

Cotton.

According to local information cotton was cultivated on a fairly large scale years ago, but apart from the few odd perennial plants common in peasants' compounds in most districts, the crop was not grown for a long time prior to the 1936-37 season when some preliminary experiments were conducted in co-operation with the owner of two estates, one at the Northern extremity of the Island and the other on the South-west coast; the results were promising and the area was increased slightly during 1937-38. Cotton lint exported during 1938 amounted to 9,600lb. value £733. An average yield of about 250lb. of lint per acre was obtained, with a ginning out turn of 30 per cent. Some 30—35 acres have been planted again for the 1938-39 season but, unfortunately, the very heavy rains during October and November caused considerable setback to the young crop, and the yield will be far short of that for the 1937-38 season. Some attention to soil erosion and windbreaks is necessary.

No difficulty has been experienced so far in disposing of the present production, but it is doubtful whether any large scale increase in production is justified in view of the limited demand on the overseas markets.

The Montserrat strain is planted as being most suitable to local conditions, and fresh seed is imported from Montserrat each year.

Before cotton growing expands to any extent in the Colony suitable legislation will have to be enacted to effectively control crop activities, such

as uprooting and burning and a proper close season; the successful control of such destructive pests as Pink Bollworm depends on prior action of this kind being taken.

Corn.

The more general planting of this crop in suitable areas throughout the Colony cannot be too strongly urged. It forms the staple diet of a large proportion of the native populations of Africa where it is extensively cultivated; it is cultivated on a very large scale also in North and South America for the manufacture of food products, and as a stock feed. Judging from the extent of annual importations of cornmeal over the past few years (details of this appear under 4. Importation of Foodstuffs) it is evident that there exists much scope for increased production. The Department is anxious to give all possible assistance to the encouragement of this crop.

Ordinarily it is possible to obtain two crops of corn a year in the more favourable districts; at present the main crop is sown about June/July and reaped in September/October during the rainy season. A secondary crop is sometimes sown in November/December and reaped in February/March during the dry season. Whilst there is some advantage in being able to obtain two crops of corn each year, it is felt that for best results, particularly from the storage viewpoint, the ripening and harvesting of the main crop should coincide with the driest part of the year. The optimum planting season would therefore appear to be during October or early November. It is intended to further investigate this important point.

Coffee.

Systematic cultivation of this crop has only been attempted in recent years and then only to a limited extent, although an excessive amount of coffee continues to be imported each year. It is noticeable, however, that a few estates are giving increased attention to the cultivation side, and there is every reason to believe that imports will be reduced to an absolute minimum in the course of the next few years.

Majority of the bearing coffee is *Coffea liberica*, Liberian coffee, and this species has been more generally planted than any other. Judging from the old established plots found in many parts of the Colony, Liberian coffee has always been popular possibly on account of its suitability to the low elevations, but also to its apparent resistance to Coffee Leaf-Miner.

The Department has raised and distributed large numbers of seedlings of Robusta coffee chiefly to peasant proprietors during the past few years, but poor results have been obtained due to unfavourable soil or situation, and general lack of attention, but more particularly to the susceptibility of this species to Coffee Leaf-Miner. It is believed that the effects of this pest could be greatly reduced by providing adequate shade for the coffee and this matter is receiving further attention.

Other species under trial and multiplication in the Departmental nurseries are Jamaica Blue Mountain coffee, (a variety of *arabica*) and Excelsa coffee.

Rice.

The cultivation of swamp rice is limited to very small wet pockets around the coast, and the cultvation of this type is entirely in the hands of local East Indians. Some attention has previously been paid by the Department to the cultivation of hill rice in the Choiseul and Laborie districts, and further efforts are to be made to encourage the more extensive planting of this crop in other suitable parts. Rice importations remain at a high figure and it is hoped to be able to reduce this figure by local production in the next few years.

Tobacco.

The areas suited to tobacco cultivation are somewhat limited, but it is hoped to be able to work up a small industry chiefly in the Soufrière valley where suitable growing conditions exist. A few isolated attempts have been made in the past to produce cigars or cheroots for the local market, and the results have been sufficiently encouraging to suggest expansion to meet local consumption in the first instance. Such a step should materially assist in reducing present annual imports of tobacco.

Vanilla.

Planting material of this crop is being multiplied in one or two nurseries of the Department, for ultimate distribution amongst peasants who wish to take up cultivation, as it is felt that a small, but useful, export market may be found for it, and there exist large areas where it should prove successful.

Pepper.

This is yet another crop which might be usefully taken up by the peasant proprietor; planting material is being multiplied also, and a considerable quantity of material will soon be available for distribution.

4. APICULTURE.

There is room for considerable development of bee-keeping for honey production. As a matter of interest the exports and value of honey and beeswax over the past five years are tabulated below :—

Honey Products.

	1934.		1935.		1936.		1937.		1938.	
	Quantities.	Value. £	Quantities.	Value. £	Quantities.	Value. £	Quantities.	Value. £	Quantities.	Value. £
Honey ...	43,051	424	4,357	415	65,290	609	104,855	954	51,702	579
Beeswax ...	168	10	...	13	239	19	330	7	716	17
Totals ...	...	434	...	428	...	628	...	961	...	596

It will be seen that exports showed a decline of some 50·6 per cent. from those of 1937, but this was entirely due to the unfavourable weather experienced during last season's honey flow. On the other hand beeswax exports increased by 117 per cent. over 1937.

Bee-keeping can be made a very profitable hobby by the peasant proprietor; the capital outlay is comparatively small, and although regular attention is necessary for maximum success, the effort is small.

5. FOREST PRODUCTS.

A further decline occurred in the production of the various classes of forest materials shipped during the year; export values totalled £2,538 for 1938 as compared with £3,093 in 1937. Charcoal, which has always been the principal feature of this industry, dropped again by 8·3 per cent. in quantity and 8·8 per cent. in value. It is not unlikely that the charcoal industry will continue to decline until some effort is made to give effect to the pertinent recommendations of the Wimbush Report, which pointed to the danger of continuing to cut the dry fuel lands on the hills in the Castries and Gros Islet quarters without any system of rotation.

The following table shows the exports under this head for the five-year period, 1934—1938 :—

Year.	Boards cub. ft.		Cedar cub. ft.		Firewood cub. ft.		Hardwood cub. ft.		Logwood tons.		Furniture.	Brooms doz.		Charcoal bags.	
	Amt.	£	Amt	£	Amt.	£	Amt.	£	Amt.	£	£	Amt.	£	Amt.	£
1934	2,008	158	103	8	79,104	196	4,008	242	67	98	147	1,052	35	89,840	4,327
1935	1,639	140	50	5	92,032	234	2,900	326	20	50	212	855	28	73,349	3,667
1936	2,317	223	10	1	90,368	228	2,414	135	42	70	58	939	26	67,594	3,265
1937	2,815	248	...	...	94,208	223	3,851	231	27	53	557	1,376	38	36,367	1,763
1938	1,009	86	80	5	22,200	174	3,145	238	...	...	390	1,280	38	33,321	1,607
Average of 5 years.	1,957	187	48	3	75,582	211	3,263	216	31	54	271	1,100	33	60,094	2,925

6. FISHING INDUSTRY.

In recent years some £7,000—£8,000 worth of fish, principally in salted and dried form has been imported annually into St. Lucia, and there would seem little reason for some portion at any rate of these importations not being met locally.

It must be admitted that it will not be easy to replace the smoked or salted codfish, a very popular importation from Canada, but it is felt that something might be done with the ubiquitous flying-fish, which is obtainable locally during most months of the year and is particularly plentiful from about February to June. It should be possible to develop a technique for curing this fish either by salting or smoking, in which case a large potential market might be found in Trinidad, quite apart from the saving to this Colony in imports if the local market could be adequately supplied.

The possibility, however, of commencing such an industry would appear to warrant investigation in the first instance by a qualified person on the spot.

The following details of exports under this head over the past five years may be of interest :—

Fish Products.

	1934.		1935.		1936.		1937.		1938.	
	Quantities.	Value. £	Quantities.	Value. £	Quantities.	Value. £	Quantities.	Value. £	Quantities.	Value. £
Shells and Turtles...	...	141	357	67	...	134	464	115	453	251
Fish Oil	...	...	...	...	...	2	...	...	...	4
Lobsters (live) ...	...	...	...	...	.. .	5	754	22	930	32
Lobsters (boiled)	...	...	...	...	...	...	...	...	24	1
Fish (pickled)	...	...	...	...	669	15	...	...	50	1

7. LIVESTOCK.

This industry has an increasingly important part to play in the future agricultural development of the Colony, in view of the attention which is being focussed on mixed farming. Considerable scope exists for the advancement of this industry in its chief phases, as emphasised in last year's Report namely, meat and milk production, draught purposes and the manufacture of

pen manure. Encouraging possibilities also exist in connection with the export of mules and horses to Trinidad and Barbados, and slaughter oxen to some of the neighbouring islands.

Undoubtedly some improvement in the stock in the Island has occurred in recent years, mainly attributed to pure-bred animals for breeding purposes imported by Government and local enterprise, but more attention will have to be paid to the grading up and better feeding of animals if increased milk production and a necessary improvement in the quality of local meat is to be achieved. In this latter connection it is a matter for regret that the Sussex bull specially imported from England in 1937 has been used to a very small extent.

Captain H. V. M. Metivier, O.B.E., B.Sc., M.R.C.V.S., Senior Veterinary Officer, Trinidad, visited the Colony during November. His visit unfortunately coincided with the dislocation of transport services consequent upon the landslides which occurred, and he was thus prevented from carrying out the programme which had been arranged for him. He was, however, able to visit the Union Agricultural Station and see the stud animals maintained there; also he visited estates in the vicinity and gave some helpful advice to the owners. It is hoped that Captain Metivier will find it convenient to arrange a lengthier visit next year. The thanks of the Department are due to Captain Metivier for his continued help and advice in all matters appertaining to animal husbandry in the Colony.

The disease situation in the Island is a singularly happy one, no diseases of a notifiable nature having occurred for many years. Malnutrition and intestinal parasites are the worst enemies of livestock.

The values of exports under this head over the past five years are given below :—

Animal Export.

	1934.		1935.		1936.		1937.		1938.	
	Quantities.	Value £	Quantities.	Value. £	Quantities.	Value. £	Quantities.	Value. £	Quantities.	Value. £
Horses ...	85	369	35	180	34	136	10	38	14	46
Asses ...	22	6	...	...	3	9	...	...	...	...
Mules ...	22	134	12	70	9	35	22	85	13	95
Total ...	...	509	...	250	...	180	...	123	...	141

Native poultry are reared in quantity to meet the growing demand for eggs and poultry, but the existing stock need much improvement. The Department has in mind work of this nature, if and when adequate funds can be obtained for this purpose. Apart from the growing demand for poultry products locally, a remunerative market has always been available for eggs and poultry to the neighbouring islands, especially Trinidad.

Animal Inspection Service.

Animal importation into the Colony during the year under review was as follows :—

Cattle	...	4
Dogs	...	17
Poultry	...	No records previously available, but number considerable, especially turkeys.

The number of export certificates issued for animals leaving the Colony was six (6).

COMPARATIVE SCHEDULE OF AGRICULTURAL PRODUCTS

		1934.			1935.		
		Quantities.	Value. £	£	Quantities.	Value. £	£
SUGAR PRODUCTS:							
Sugar, Vacuum Pan	tons ...	4,730	39,396		6,080	48,377	
Molasses & Syrup	galls. ...	23,080	1,431		168,903	2,401	
Rum	,, ...	...	...	40,827	...	...	50,778
LIME PRODUCTS:							
Concentrated Lime Juice	galls. ...	3,371	228		1,080	45	
Raw Lime Juice	,, ...	10,525	471		29,613	854	
Distilled Lime Oil	lb. ...	13,406	12,275		10,264	9,673	
Essential H.P. Otto of Limes	lb. ...	1,251	1,868		1,504	2,517	
Green Limes	brls. ...	6,001	7,010		6,619	8,035	
Pickled Limes	,, ...	...	...	21,852	...	...	21,124
COCONUT PRODUCTS:							
Coconuts	No. ...	2,616,175	7,298		2,814,965	7,632	
Copra	tons ...	302	2,592	9,890	215	1,871	9,503
CACAO PRODUCTS:							
Cacao	cwt. ...	6,349	6,032	6,032	627,809	6,042	6,042
BANANAS	bchs. ...	18,377	1,499	1,499	60,439	5,209	5,209
FOREST PRODUCTS:							
Boards (native)	c. ft. ...	2,003	158		1,639	3	
Cedar	,, ...	103	8		50	3	
Firewood	cords ...	618	196		719	234	
Logwood	tons ...	67	98		20	50	
Hardwood	c. ft. ...	4,008	242		27,168	182	
Brooms	doz. ...	1,052	35		855	28	
Charcoal	bags. ...	89,238	4,486		73,349	3,667	
Furniture (Household)	...	...	147		27	218	
Miscellaneous	...	...	...	5,372	...	...	4,385
FRESH FRUIT & PRODUCTS:							
Mangoes	crates ...	7,881	1,372		6,556	1,567	
Oranges	,, ...	374	92		291	91	
Grapefruit	,, ...	32	13		122	35	
Pineapples	,, ...	36	16		...	3	
Avocado Pears	,, ...	2,245	389		3,857	709	
Mixed Fruit	...	...	1,917		5,496	1,699	
Preserved Fruits	...	...	38		2,318	53	
Jams, Jellies, etc.	...	...	47		...	...	
Miscellaneous	...	...	3	3,887	...	...	4,157
SPICES:							
Nutmegs	lb. ...	8,272	102		4,736	63	
Mace	,, ...	1,062	51		1,032	44	
Kola Nuts	,, ...	15,688	121		11,776	106	
Miscellaneous	,, ...	35	2	276	...	62	275
LIVE STOCK & PRODUCTS:							
Hides & Skins	No. ...	1,391	97		2,879	145	
Shells & Turtles	lb. ...	...	141		357	67	
Fish Oil	galls. ...	...	...		...	...	
Horses	No. ...	85	369		35	180	
Asses	,, ...	22	6		...	...	
Mules	,, ...	22	134	747	12	70	462
HONEY PRODUCTS:							
Honey	lb. ...	43,051	424		44,357	415	
Beeswax	,, ...	168	10	434	...	13	428
BAY PRODUCTS:							
Bay Oil	galls. ...	2	8		9	4	
Bay Rum	,, ...	1,424	301		1,168	243	
Citrocol	,, ...	...	...	309	...	...	247
VEGETABLE PRODUCTS:							
Plantains	bchs. ...	208	14		512	38	
Farine	lb. ...	22,202	113		13,128	66	
Yams	,, ...	...	7		...	4	
Miscellaneous	...	...	105		...	14	
Pumpkins	,, ...	...	...	239	...	...	122
MISCELLANEOUS PRODUCTS:		...	317	317	...	500	500
Total Exports	...			91,679			103,232

AND BY-PRODUCTS EXPORTED FROM ST. LUCIA, 1934—1938.

1936.			1937.			1938.		
Quantities.	Value. £	£	Quantities.	Value. £	£	Quantities.	Value. £	£
7,707	60,358		7,225	62,313		7,806	64,711	
107,128	1,132		144,016	3,201		150,278	3,086	
...	...	61,490	2,427	243	65,757	10,251	1,186	68,983
3,317	160		1,109	60		270	12	
34,171	1,405		11,350	602		31,216	1,509	
5,463	6,091		11,305	10,187		9,395	8,352	
810	1,047		2,106	2,946		876	1,178	
5,731	6,977		3,537	4,420		2,579	3,353	
...	...	15,680	26	28	18,243	20	25	14,429
3,409,621	9,608		2,993,422	10,476		2,674,148	8,278	
306	3,561	13,169	404	5,335	15,811	306	2,906	11,184
6,538	9,627	9,627	5,585	13,357	13,357	6,198	8,332	8,332
103,633	8,910	8,910	126,940	11,814	11,814	100,726	13,568	13,568
2,317	223		2,815	228		1,009	86	
10	1		...	...		80	5	
706	228		94,208	223		555	174	
42	70		27	53		...	...	
2,414	135		3,851	231		3,145	238	
939	26		1,376	38		1,280	28	
67,594	3,265		36,367	1,763		33,321	1,607	
...	50		...	557		...	390	
...	81	4,079	...	...	3,093	...	77	2,615
8,046	1,619		9,591	2,032		...	1,900	
126	30		107	24		610	53	
285	84		306	121		325	89	
17	2		36	7		...	31	
3,336	504		3,960	623		...	509	
6,749	1,891		...	1,617		...	1,299	
...	54		...	41		...	113	
...	51		...	56		...	53	
...	16	4,251	...	...	4,521	...	11	4,058
10,509	134		10,066	184		15,201	230	
1,913	72		1,892	99		2,183	97	
11,155	70		15,546	144		11,683	96	
2,037	39	315	2,436	41	468	...	87	510
4,329	132		2,446	294		1,376	124	
...	134		464	115		453	251	
7	2		...	...		...	4	
34	136		10	38		14	46	
3	9		...	...		...	...	
9	35	448	23	85	532	12	95	520
65,290	609		104,855	954		51,702	579	
239	19	628	330	7	961	716	17	596
...	...		...	...		...	...	
1,136	227		906	177		1,322	254	
...	...	227	212	89	266	192	90	344
965	63		1,256	76		1,468	85	
17,039	103		13,262	108		31,471	214	
...	6		...	1		...	6	
...	565		...	136		...	133	
..	...	737	...	430	751	71,244	244	682
...	797	797	...	47	47	...	832	832
		120,358			138,238			126,640

SUMMARY STATEMENT OF THE PRINCIPAL ARTICLES IMPORTED INTO THE COLONY

Articles.	Quantities.				
	1934.	1935.	1936.	1937.	1938.
CLASS I.—FOOD, DRINK, AND TOBACCO :					
Animals—Horned Cattle No.	...	4	...	3	4
Beer and Ale gals.	2,794	4,611	3,528	5,805	3,726
Biscuits, Bread and Cakes lb.	30,484	35,944	37,204	40,989	41,163
Butter ,,	43,742	48,729	51,593	51,176	49,136
Butter Substitutes ,,	84,486	100,669	107,932	105,832	118,497
Cattle and other Animal Foods lb.	33,062	24,566	28,692	23,834	25,360
Cheese ,,	11,880	15,327	13,853	16,091	13,707
Coffee ,,	51,692	60,963	63,071	63,257	68,763
Confectionery	...	...	...	...	...
Fish :					
Salmon, Mackerel and Trout lb.	11,904	12,843	19,496	16,700	18,000
Other kinds ,,	387,409	666,302	772,439	638,399	690,925
Grain, Flour, Pulse &c.					
Grain—Oats lb.	9,820	7,955	7,550	9,506	1,920
Rice ,,	779,979	438,588	575,368	693,339	655,597
Flour—Wheaten ,,	3,736,788	3,143,512	3,104,982	3,041,951	3,338,483
Cornmeal ,,	84,280	36,266	51,268	75,754	84,652
Pulse : Beans, Peas ,,	29,380	32,910	47,692	43,114	52,410
Lard & Lard Substitutes ,,	53,201	58,375	54,815	59,599	64,950
Meat :					
Canned ,,	5,123	5,394	8,333	8,378	9,892
Salted, Pickled, Smoked or Cured lb.	45,852	52,411	54,668	58,117	57,214
Oil—Edible gals.	44,197	44,396	42,237	37,319	42,239
Salt—Coarse tons	566	415	391	518	375
Spirits :					
Gin p. gals.	443	531	394	402	457
Rum ,,	677	892	792	1,105	1,043
Whisky ,,	955	1,142	923	946	834
Cordials & Liqueurs l. gals.	73	119	153	138	81
Sugar—Unrefined lb.	170,560	23,253	92,726	102,964	289,257
Refined ,,	86,120	162,848	152,677	162,955	162,199
Tobacco and Snuff :					
Unmanufactured lb.	27,001	29,286	32,976	35,521	40,659
Manufactured, Cigarettes ,,	7,936	8,191	8,544	9,127	7,668
Other kinds ,,	7,594	9,039	9,606	8,810	8,323
Vegetables, Fresh ...	...	...	...	...	...
Wine, Still gals.	2,835	3,453	4,217	4,230	4,287
Other Articles ...	...	...	...	...	...
Total					

ULE II.

OF SAINT LUCIA CLASSIFIED ACCORDING TO GROUPS, DURING THE YEARS 1934—1938.

Value.				
1934.	1935.	1936.	1937.	1938.
£	£	£	£	£
...	38	...	55	47
676	1,036	776	1,219	803
728	840	927	1,149	1,064
2,161	2,497	2,651	2,888	3,127
1,752	1,971	2,265	2,216	2,088
166	97	119	130	130
401	542	571	664	599
1,001	1,128	890	991	930
596	628	897	917	930
91	153	179	165	304
4,702	6,817	6,735	7,703	7,122
34	33	29	45	10
3,431	1,995	2,320	3,168	2,976
19,798	16,795	17,348	23,192	20,912
423	168	243	399	420
270	278	433	399	430
959	1,136	1,157	1,339	1,365
147	157	233	263	291
1,402	1,527	1,474	1,655	1,599
4,766	5,611	6,187	5,950	1,325
778	507	495	579	448
458	479	395	415	472
315	499	496	613	598
1,466	1,653	1,500	1,531	1,381
175	186	315	336	253
929	139	469	536	1,528
459	730	753	861	839
779	908	1,109	1,430	1,772
2,463	2,650	2,882	2,945	2,296
1,625	1,893	1,992	1,785	1,634
453	471	409	584	432
577	669	957	874	886
3,789	4,088	4,192	4,983	8,636
57,770	58,319	61,398	71,979	67,647

3. SOIL AND FOREST CONSERVATION.

(a) *Crown Lands Allocations.*

During 1938 a total of forty-one (41) applications for Crown Lands were received from the Crown Lands Department for consideration, which together with twenty-one (21) applications brought forward from 1937, amounted to sixty-two (62); of these eight (8) were approved and seventeen (17) were rejected, while owing to shortage of staff and emergency work in connection with storm relief, thirty-seven (37) applications had of necessity to be carried forward to 1939. Details of this work are as follows :—

	1—5 acre units.	5—10 acre units.	10—15 acre units.	15—20 acre units.	20 acres and over units	Total Acres.
Approved ...	3	5	...	...	...	49
Rejected ...	3	13	...	1	..	121

(b) *Soil Conservation.*

This subject is of such importance, that the following extract from a review of this work in the Colony during 1938 should be of particular interest to all landowners :—

" Although no spectacular progress can be reported in the carrying out of anti-soil erosion measures during the year under review, an increasing amount of public interest in soil conservation methods is noticeable, particularly following the disastrous landslides which occurred during November. The Agricultural Department is fully alive to the importance of this problem and action has been taken on the following lines—

(a) Demonstrations of terracing, contour draining and the planting of suitable grasses on the contour in the several nurseries of the Department in various parts of the Island.

(b) Talks to children in the schools.

(c) Talks and demonstrations to peasants on their land.

(d) Talks when feasible on Sundays at Friendly Society halls in various districts. A leaflet on soil erosion, embodying simple measures to be taken by the peasant, was prepared also and freely distributed among all the churches and schools with a view to the contents being as widely disseminated as possible ; and a copy of the leaflet is forwarded to every approved applicant for a grant of Crown Lands.

The present position regarding soil erosion in St. Lucia is admittedly a serious one, although probably not as serious as some of the other West Indian islands, and calls for continuous effort by this Department. Generally speaking it is evident that the peasant agriculturist is as yet still unappreciative of the necessity for any action being taken to check erosion, due to the fact that he is inherently a poor agriculturist. The average peasant has little use for level land as it requires the expenditure of more energy than he is prepared to give in order to adequately drain it for cultivation purposes. Such land is invariably planted to Tania which thrives in these water-logged soils. There has always been a strong tendency to resort to the forest areas where certain ground provisions thrive with the minimum of effort, and it is generally believed that such soils do not require drainage at all. Burning of gardens preparatory to the annual planting of crops is regularly practised by almost one and all, and it is extremely difficult to convince a peasant of the folly of this practice.

Progress in soil conservation methods in St. Lucia will continue to be retarded until such time as the existing easy system of Crown Land grants is considerably tightened up. Under the present arrangement there is nothing to prevent a person from regularly acquiring a new area of Crown Land when his previous grant or grants cease to be productive, provided he is able to meet the nominal charge of £1 per acre plus survey fees. Another flagrant obstacle is the uncontrolled squatting and devastation which has been continuing for years past in the unescheated or ungranted lands of the Colony. When these two difficulties have been overcome it is certain that organised land settlement schemes, which are under consideration for certain districts of the Colony, will do much by way of ocular demonstration to prove the advantages of anti-soil erosion measures to peasants already in possession of freehold land.

The nurseries of this Department continue as important centres of soil conservation demonstration, and it is of interest to note that the highest precipitation for any one day in the Colony during 1938 was recorded at our Barre de l'Isle nursery. (9.51 inches on November 10th) and that despite the unprecedented rains of November which caused the largest landslides within a few miles radius of the nursery, the damage in the nursery which is contour drained was negligible. Further demonstration in new districts or areas is restricted by lack of funds, but efforts will be made during this year to extend the demonstration service, the success of which will depend to a certain extent on the co-operation of influential peasant proprietors and others.

In St. Lucia there is an interesting correlation between density of population per square mile in the several districts and the standard of agriculture practised. With the help of the Labour Commissioner the following figures of density of population per square mile are tabulated : —

District.	Population per square mile (approximate).	General Standard of Agriculture.
Castries ...	408*	Fair. Isolated efforts at contour cultivation and planting are to be seen chiefly in the vicinity of the large sugar estates, but there is still much room for improvement.
Anse-la-Raye ...	120	Poor. Little land available at the lower elevations and much land under cultivation at the higher elevations is unsuitable and ought not to have been sold out. A good deal of shifting cultivation is still going on in the forest areas of this district.
Soufrière ...	206	The standard was undoubtedly good until recently, as permanent crops such as cocoa, limes and sugar were cultivated by majority of the peasant proprietors in this district and served as considerable protection against soil erosion, but unremunerative markets in recent years have discouraged them, and their holdings are not receiving the same attention as previously.
Choiseul ...	552	Good. Most of the annual cultivation is done on raised beds drawn across the slope of the land. Burning is practised to a small extent.
Laborie ...	298	Good. Similar to the Choiseul district.
Vieux-Fort ...	186	Most of the land in this district is now owned by the Barbados Land Settlement Coy., but in any case the local population are not enterprising agriculturists.
Micoud ...	95	Poor. Little cultivation is done at the lower elevations where much of the land has become impoverished, and the forest areas have always been accessible to shifting cultivation for the easy production of ground provisions, etc.
Dennery ...	157	Poor. Position somewhat similar to that in the Micoud district.
Gros Islet ...	138	Very poor. Methods of cultivation still primitive, with no attempt at soil conservation.

* This figure includes a large suburban population centered around Castries Town.

It may be of interest to record the fact that although density of population in the Choiseul and Laborie districts is to some extent responsible for the higher standard of agriculture practised, it is also due to the type of soil peculiar to these districts which is a

friable loam of light texture easily susceptible to surface erosion, and which without reasonable protection would soon cease to be productive."

It is to be hoped that active interest will be aroused in this work in the near future by estate owners and peasant proprietors, and the advice and assistance of this Department can be counted upon to the fullest extent possible.

(c) *Forest Conservation.*

It is very gratifying to be able to record that funds are being made available under the 1939 estimates for the commencement of a Forestry division of the Department. The establishment of two regular forest patrols will go a long way towards controlling squatting and illegal timber cutting in the forest areas, and should eventually be able to prevent these undesirable practices altogether. A very important matter is the acquisition by Government as soon as possible of all unescheated or ungranted lands in the Colony, mainly situated in the primary forest areas, since Government appears to have no adequate control over these areas at present, and large areas of these lands are rapidly being devastated by squatters.

Although no actual funds have been provided for reafforestation work, seeds of Teak and Honduras Mahogany were imported and distributed amongst the nurseries of the Department for propagation. Good germination has been obtained from the seed, and a useful number of plants will be available for small scale reafforestation during 1939. A programme of reafforestation with commercial timber trees for the abandoned forest areas could be carried out with great advantage, subject to the necessary funds being made available.

For the drier coastal areas *Cassia siamea* is under trial as a suitable tree for windbreaks or shelter belts.

4. IMPORTATION OF FOODSTUFFS.

In view of the large annual importation of foodstuffs of all kinds into the Colony and the relationship which this importation must bear to local production of food crops, it has been decided to tabulate this information in future and to give some explanation of the necessity for such importations.

Quantities and values of imported foodstuffs during the past five years are shown in Schedule II. A study of this Schedule reveals that the present importation of foodstuffs is unduly high for a Colony which recognises agriculture as its staple industry. Whilst it must be admitted that certain foodstuffs, particularly wheaten flour, could not in any circumstances be produced locally, there is no reason why closer attention should not be given to the increased production of those foodstuffs which can be grown. For instance, the importation in increasing quantities of cornmeal, beans and peas can only be regarded as an unsatisfactory tendency; it should be possible to meet local consumption of these food crops from production within the Colony, and the annual importation of wheaten flour would seem capable of some reduction if the variety of food crops which can be grown here were more extensively cultivated.

A considerable quantity of rice is imported each year, which to some extent at any rate could be produced locally. Swamp rice cultivation is very limited, but the cultivation of hill rice offers encouraging possibilities.

The importation of salted fish continues at a high figure; it is hoped that recommendations made to the Royal Commission may result in some investigation being made into the possibilities of commencing a salted fish industry in the Colony.

The increasing consumption of edible oils and fats should be met from locally produced copra, which could be sent to Trinidad for processing.

With the interest being shown in tobacco growing in the Soufrière Quarter, some reduction in the importation of this commodity should ultimately be possible. Coffee growing is receiving more attention also; this should lead to a welcome decrease in importations and, it is hoped, an ultimate supply adequate for all local demands.

A certain amount of meat in various form is annually imported, which ought not to be necessary were more attention paid to proper maintenance and feeding of livestock in the Colony.

Efforts are now being made to improve the present quality of local rum to a standard comparable with that which is imported at present. If these efforts succeed there is every reason to think that imports will be reduced to a minimum.

It will be seen from the foregoing that considerable scope exists for a campaign towards greater self-sufficiency in this Colony.

SECTION II. WORK IN THE DEPARTMENT OF AGRICULTURE.

1. Work in the Botanic Gardens.

Little work of importance, other than general maintenance, was done in the Botanic Gardens, the majority of the propagation work with ornamentals having been transferred to the Union Agricultural Station. Final arrangements for the transfer of the Gardens to the Castries Town Board were completed during the year, and the area was formally taken over by this body on September 1st; under the Botanical Station (Transfer) Ordinance (No. 12 of 1938) the area is now known as the "George the Fifth Park".

The meteorological station continued on its original site in the Park, and arrangements were made for the continuation of the routine readings; through the courtesy of the Castries Town Board the fumigatorium was also allowed to remain in the Park pending the completion of arrangements for its removal and re-erection on a more suitable and convenient location.

Plant and Seed Introduction.

The following plants and seeds were imported by the Department during the year :—

Quantity.	Description.	Source.	Remarks.
1,500 lb.	Black Eye peas	Barbados	For distribution as early food crop after November rains.
12 cuttings	Hibiscus varieties	Trinidad	Planted at Union Station.
12 ,,	Ixora varieties	do.	do. do.
9 ,,	Hibiscus varieties	Barbados	do. do.
100 buds	Boon's Early orange	Dominica	For Union and Rabot.
100 ,,	Florida Orange	do.	do. do.
1 oz.	Selected Marglobe Tomato	Montserrat	For distribution.
1 pkt.	*Pimenta acris* (Bay)	do.	do.
1 ,,	*Pimenta Officinalis*	Dominica	do.
2 lb.	Pigeon Peas	Trinidad	do.
¾ lb.	Cauliflower	do.	do.
24 plants	Pineapple plants	Antigua	Planted at Union Station.
24 nuts	Souari Nuts (*Caryocar Nuciferum*)	British Guiana	do. do.
29 lb.	Teak	Trinidad	For Union & other nurseries.
2,000 seeds	Barbados Mahogany	Barbados	do. do.
½ ton	Sea Island Cotton Seed	Montserrat	For distribution.
2 oz.	Seed of Puerto Rico and Mexican Papaw	Trinidad	Planted at Union Station.
½ lb.	Hybrid Lupin	Tanganyika	do. do.
¼ lb.	Kudzu Vine	do.	do. do.
4 plants	Raspberry	Trinidad	do. do.

In addition to the above, a regular supply of vegetable seeds was maintained by the Department for local sale.

Plant Inspection Service.

(a) *Imports.* A total of one hundred and ten (110) importations, exclusive of those mentioned above as made by the Department, was examined; these comprised mainly collections of vegetable and flower seeds, together with other miscellaneous planting material. Seventy-six consignments passed through the fumigatorium or were otherwise treated, and eight consignments were destroyed, consisting of prohibited seeds, plants in soil, and diseased fruits; the attention of the public is again drawn to the need for the fullest co-operation with the Department in this work of preventing the introduction of pests and diseases.

(b) *Exports.* Twelve (12) Certificates of inspection were issued for planting material leaving the Colony.

Plant Propagation.

The bulk of this work was carried out at the Union Station, but a certain amount of established material was kept at the Gardens for distribution; in addition to 29 plants transferred to Union prior to the transfer of the Gardens, a total of 286 plants was distributed up to the end of August, making a total distribution to that date of 315 ornamentals.

2. Work at the Union Agricultural Station.

1. *Staff.* The essential staff of the Station, with which is combined the Government Stock Farm, and which is situated some 4½ miles from Headquarters, comprises a resident Foreman, a Stockman and a Nurseryman. The Assistant Agricultural Superintendent is directly in charge of the Station, and pays supervisory visits as often and as regularly as permitted by his other duties.

2. *Weather Conditions.* Weather conditions were generally normal throughout the greater part of the year, though additional rain would have been welcomed during the dry months, especially as the irrigation pump was not available as early as required; as a contrast, the unprecedented rainfall during November resulted in the total flooding of the valley on more than one occasion; damage amounted to some scouring of the river banks, partial collapse of the small stone-walled ravine leading from the stables, and the washing away of some 3,000 young mango stocks for propagation, together with a fair amount of mulch and other vegetable matter; no actual damage was done to established crops apart from the effects of waterlogged conditions that prevailed during the periods of heavy rainfall; additional expenditure of £50 was authorised for the repair of flood damage.

Precipitation during the year was as follows:

Month.	*Total.*	*Maximum.*	*Date.*	*Days of Rain.*
Jan.	6·11	2·00	2nd	21
Feb.	2·69	0·65	11th	16
March	3·76	0·52	8th	18
April	4·63	1·31	17th	16
May	6·36	1·57	25th	25
June	10·40	2·05	12th	28
July	8·97	1·38	21st	27
Aug.	15·91	2·00	27th	30
Sept.	7·92	1·30	24th	26
Oct.	14·36	1·98	14th	27
Nov.	44·86	5·52	10th	26
Dec.	10·23	1·30	28th	28
Year	136·20	5·52	Nov. 10th	288

Distribution of Planting Material.

	1934	1935	1936	1937	1938
Lime Seedlings	1,575	...	...	...	...
Budded & Grafted limes	8,202	6,454	8,648	5,288	5,483
Sour Orange Seedlings *	100	1,548	...	...	7,084
Budded Oranges	2,407	1,651	647	741	345
Budded Grapefruit	2,510	1,261	554	180	255
Budded Lemons	53	50	25	..	...
Grafted Mangoes	14	53	7	79	41
Grafted Avocados	...	39	16	108	44
Pineapple plants	...	...	62	...	...
Coffee, Robusta	4,374	4,540	16,493	17,758	5,386
Dwarf Coconuts	42	112	117	208	323
Mango stocks	10	...	...	...	...
Tonka Beans	...	...	72	...	...
Total Orchard plants	24,443	15,792	26,641	24,362	18,961
Cane plants	22,308	11,545	800	6,544	2,254
Forest plants	161	306	120	47	...
Vegetable seedlings	2,725	...	...	...	...
Tannias	...	...	...	...	...
Dasheen	60	...	...	...	...
Sweet potato cuttings	35,200	...	...	...	...
Potato yams	5	...	...	...	...
Plantain suckers	...	18	...	...	...
Bananas	357	29,272	18,378	1,352	502
Total Economic Plants	85,249	56,933	45,939	32,305	21,717
Corn (lb.)	...	...	20	...	30
Green-dressing (lb.)	18	221	302½	149	275½
Cover crop cuttings (bdls.)	...	...	6	...	...
Fodder plants & grasses	...	17	203	2	7
Pasture grasses	663	400	6	2	15
Lemon grass (stools)	300	101	660	...	...
Ornamental plants & cuttings	1,471	1,242	1,925	833	583
Hedge & fence sticks (bdls.)	6	...	12	...	...

* Mainly for nursery work.

3. GENERAL OBSERVATIONS ON THE ECONOMIC CROPS.

Grapefruit.

Orchard Plots. (Section 11). Satisfactory growth was made and all trees bore a fair crop which commenced to mature in December. Effects of *Diaprepes* attack were not so noticeable as in past years, but the incidence of Gummosis continued high on the low-budded Florida stock of Marsh and Duncan.

Selection Plots. (Section 12). In spite of generally excellent growth made by the local selections of Marsh Seedless trees on this section, cropping was not entirely satisfactory, and as yet the clonal characteristics of these selections have not been definitely observed. A few trees badly effected by *Diaprepes* attack during 1936 and 1937 continued to make good recovery; the perfect shaping of the trees still continues to be affected by excessive wind-currents from the steep hill-side behind this section.

General. In addition to the usual heavy mulching a certain amount of irrigation was practised in the dry months in order to maintain optimum growth conditions; in both orchard and selecting plots the ground cover of *Indigofera endecaphylla* has flourished, together with *Tephrosia candida* in

the intervening beds of the selection plots: in the latter area also a few beds were used for nursery work, while stools of I.C. 2 and Giant Cavendish bananas were maintained. The drainage system, though severely overtaxed by repeated floodings during November, was otherwise satisfactory. All trees in both sections received lime, pen manure, and two dressings of a complete fertiliser during the year.

Oranges.

Orchard Plots (Section 11). All trees made good growth, and cropping was entirely satisfactory, yields comparing well with those of 1937. Some trouble was experienced with rust-mite in spite of routine spraying, and birds were again responsible for losses of nearly matured fruit. Damaging of fruit by birds received the attention of the Citrus Pests Entomologist, Mr. R. G. Fennah, and a short note on the subject of control appears elsewhere in this Report.

Orchard Section (Section 8). There has been a continued response to the cultivation and redraining done during 1937, and growth has been generally good. Trees of the Ruby and Pineapple varieties bore especially well, though heavy rust-mite infection and bird damage were experienced.

General. Irrigation was necessary during the drier months, combined with mulching of all trees. *Indigofera* was maintained as a ground cover in the Orchard plots, and also on a few beds in the orchard section, the remaining beds being kept clean weeded, with an intercrop of Giant Cavendish bananas. Slaked lime, pen manure and two applications of a complete fertiliser were given at appropriate intervals.

Budded Limes.

Orchard Plots (Section 11). The collection of hybrid and West Indian limes in this section was maintained in good condition, and all trees cropped well. A general pruning and shaping-up of the trees was done during the year, while manuring comprised an application of pen manure and one dose of a mixed nitrogen-phosphate fertiliser. *Indigofera endecaphylla* was extended as a cover crop throughout the lime plots, together with some *Dolichos Hosei.*

Orchard Section (Section 8). Owing to the need for extension of the fodder growing area, the scattered lime trees in this section were discarded and the area put to grass; the varieties have, however, been repropagated for planting in the orchard plots in due course.

Lemons.

Orchard Plots (Section 11). All varieties bore good crops of medium-sized fruit, though the trees were heavily attacked by scale insects as compared with the relative freedom from this pest on other citrus growing in this section. More attention was paid to manuring, and two applications of a complete citrus fertiliser were given, together with an extra supply of pen-manure. Three cases of Gummosis were treated.

Avocados.

Orchard Section (Section 8). Further losses from root troubles associated with excessive soil moisture were noted during the year, and there are now only four semi-dilapidated trees surviving; it is planned to remove the remaining trees and replace them with specimens of other economic trees more adaptable to the prevailing conditions.

Coconuts.

Dwarf varieties (Section 4). These trees have continued to flourish, and the yield of dry nuts for propagation was satisfactory; of the three

varieties grown, the "Red" proved the most prolific, followed closely by the "Green", though the latter tends to produce slightly larger nuts; the "Yellow" variety, under Union conditions, has so far proved inferior in yield and size.

Local selections (Section 4). In comparison with the Dwarf coconuts growing in close proximity, these trees are decidedly unsatisfactory, and it is felt that better use can be made of the area that they now occupy; two beds have already been cut out and prepared for maize experiments, and it is planned to utilise the remainder of the land as and when needed for other experimental work.

Mangoes.

Orchard section (Section 8). The following varieties were maintained during the year:—Dora Barbardiensis, Graham, Peach, Ennuna, Ceylon, Bombay, Madam, Martin and Julie. All trees made good growth and set fair crops with the exception of the Ennuna, which, though some nine years old, has not yet flowered. Some of these trees, especially the Grahams, have somewhat overgrown their space "allotment", and it is proposed in the near future to cut-back heavily all duplicate trees and top-work with Julie selections. The bulk of the Julie crop was used for a trial shipment by the Government Marketing Depot (q.v.).

Sugar Cane Variety Plot (Section 5).

Small beds of the following varieties were maintained for local distribution as required:—

B.H. 10 (12)	S.C. 12/4
B. 2935	Co. 213
B. 3013	Co. 290
B. 3124	C.P. 807
B. 3125	D. 11/28
B. 3127	D. 66/30
B. 3138	D. 49/30
B. 3439	Diamond 10.
Ba. 11569	

No new introductions were made; a total of 2,254 cane plants was distributed from this plot during 1938.

Extension Plot (Section 5).

Grapefruit. The Marsh Pink and Foster Pink varieties made good growth, the latter setting a fine crop of fruit; the younger Marsh trees are expected to commence bearing in 1939.

Oranges. Both the Lue Gim Gong and Hamlin set their first fruit during the year. The Dancy Tangerine and King Tangerine bore well, though the fruit was not yet up to standard as compared with that of similar varieties seen in other colonies.

Avocados. The young trees of Trapp, Simmons, Butler and Pollock bore a fair crop, but already the trees are showing signs of dieback; propagation of these varieties for trial in more suitable localities is under way.

Miscellaneous. Both the Barbados Cherry (*Malphigia glabra*) and Jack fruit (*Artocarpus integrifolia*) have continued to thrive.

Other Miscellaneous Crops. The trees of *Hydnocarpus anthelmintica* established by the river at the entrance of the Station have made excellent growth and have borne a few fruit.

Arrangements have been made for the establishment in 1939 of a plot of Black Pepper (*Piper nigrum*) from material growing on the Station.

4. NURSERY WORK: PLANT PROPAGATION.

Some 2,500 budded citrus plants were produced during the year, of which 1,500 were limes, the remainder comprising oranges and grapefruit; other economic crops propagated included mangoes, avocados, pineapples and Robusta coffee, together with teak, mahogany and various ornamentals. A comparative statement of planting material distributed annually by the Department as a whole appears elsewhere in this Report.

5. THE ORNAMENTAL SECTION.

As mentioned in this Report for 1937 this section was established in view of the transfer of the Botanic Gardens to the Castries Town Board. Work has progressed satisfactorily and the area now adds considerably to the pleasant appearance of the Station as a whole. The knoll to the north of the main buildings has been further cleared and the old foundations cleaned up and levelled to provide a permanent site for the meteorological station; a spur of the knoll has been terraced and a rose garden, comprising some 20 varieties of roses budded on hardy stock has been successfully established on the level top of this spur. Beds for the more hardy annuals were laid out and planted, and a collection of *Hibiscus*, *Ixoras*, *Bougainvilleas* and *Oleanders* is being made for planting in their respective plots. Liberal use of Java grass (*Polytrias praemorsa*) has been made for paths, erosion control on the terraces and general turfing.

Outstanding trees in this section are the Flamboyante (*Poinciana regia*), *Spathodea canpanulata*, Cannon ball tree (*Couroupita guianensis*), *Cassia nodosa*, Cohune palm (*Attalea cohune*) and a fine specimen of *Araucaria bidwillii*, Moreton Bay Pine, believed to be the only specimen in the Colony.

Nursery Work with Ornamentals. Every effort was made to keep to the normal schedule with this work, and the propagation of the more popular types was continued on the usual scale; it is encouraging to record that, as a result of the interest taken by the general public in the new Ornamental Section, the volume of plant orders has increased considerably, and the nursery work will have to be extended during 1939. The need is now felt for some additional water supply during the dry weather, as the existing motor driven pumps cannot raise the river water to the level required: it is unfortunate that the "Aermotor" pump, replaced in 1935 by the present system, is no longer available.

6. GOVERNMENT STOCK FARM, UNION STATION.

The following animals were maintained at the Government Stock Farm during the year:—

1 Holstein Bull.
1 ¾ Holstein-Zebu Bull.
1 Sussex Bull.
1 Kentucky Jack Donkey.
1 Large Black Boar and 3 Sows.
1 Berkshire Boar and 2 Sows.

The animals generally kept excellent health and condition, and their services were fairly well utilised; the return of Station services, tours and time on tour appears below:—

——	Jack.	Purebred Holstein Bull.	¾ bred Holstein Zebu Bull.	Sussex Bull	Large Black Boar.	Berkshire Boar.
Station Services ...	19	12	9	...	6	11
No. of tours ...	2	...	2	1	...	...
Days on tour ...	70	...	93	176	...	...

Eighteen pigs (16 Large Black and 2 Berkshire) were bred and sold from the Station at 10*s*. each for breeding purposes; the continued demand for these animals taxes present breeding capacity to the utmost, and the number of sows is to be increased from Station stock. Two four months old Large Black Boars were purchased from Trinidad in December at a cost of $12.00 and $11.00 each respectively; these will form a valuable addition to the herd, and will enable the present boar to be replaced in due course.

Damp conditions caused the death of two sheep; owing to the frequent losses of sheep at Union it was finally decided to dispose of the remainder and thus put an end to the uphill task of maintaining these animals under unfavourable conditions.

The Station was inspected during November by Captain H. V. M. Metivier, O.B.E., B.Sc., M.R.C.V.S., Senior Veterinary Surgeon, Trinidad. Captain Metivier commented favourably on the general condition of the animals and accommodation, and gave much helpful advice on various aspects of animal husbandry.

Further progress has been made with the extension of fodder areas, and the time is not far off when the needs of the Stock Farm, in so far as green fodder is concerned, will be supplied from Union. Guatemala grass, together with some Guinea grass and Uba cane, has been extended wherever possible as permitted by available funds, and the purchase of a chaff-cutter—a long-felt want—is envisaged during 1939.

III. THE PLANT NURSERIES.

(a) *Botanic Gardens.* Reported under "Work in the Botanic Gardens."

(b) *Union Agricultural Station.* See under "Work at the Union Agricultural Station."

(c) *Rabot Nursery, Soufrière.* As in former years, citrus propagation formed the main work in this Nursery, the bulk of the production comprising budded limes. In addition to citrus, propagation work was done with mangoes, avocados, and other crops as required to meet the demands of the extensive district served by this station. Other work done included the raising of sour orange stock to supply the nursery section at Union (stocks cannot be grown from seed at Union owing to the incidence of "Scab" disease), and investigations into a suitable method of composting. The Nursery serves also as a valuable demonstration plot for most aspects of estate and peasant agriculture.

(d) *Citrus Nursery, Dennery.* The production of budded limes was the main item of the year's work, together with a limited number of other citrus. Good work was done during the year, but the fall in the demand for budded plants has rendered further work in this area unnecessary and the Nursery was closed at the end of the year; ample facilities exist at the Union and Rabot (Soufrière) Nurseries for the production of normal requirements, and under more favourable conditions of rainfall, soil suitability, and supervision.

(e) *Barre-de-L'Isle Nursery.* Propagation work in this Nursery has been extended to cope with an increased demand for budded orange plants; coffee, vanilla, nutmegs, cacao, fodder grasses and other peasants crops have made progress, and the steep slopes of this area make a demonstration of terracing and other soil erosion control measures particularly effective; these measures were strikingly successful during the unprecedented rainfall of November, the Nursery remaining undamaged in the midst of an area where every cleared or cultivated plot was well nigh devastated by erosion and landslides. The planting of a teak plot and further contouring of slopes is contemplated for 1939. In spite of the ravages of Panama Disease, 363 stems of bananas were

sold during 1938, while some 300 stems were used by the Government Stock Farm. Propagation experiments with tonka beans were continued, and it is hoped to publish the results at a later date.

(f) *Quilesse Nursery, Murray Road Land Settlement Scheme.* Work at this Nursery continued on a satisfactorily high standard during the year; banana sales amounted to 1,786 stems, the total revenue for 1938 being £176 17*s.*; it is unfortunate that present labour facilities in the Quilesse area do not permit the lifting of all marketable stems, and the total stems sold shown above is considerably less than the total production of the Nursery; citrus propagation, mainly with oranges, was carried on, together with coffee, vanilla, teak, mahogany, fodder grasses and other minor economic crops. Here again the value of reasonable soil erosion control measures has been demonstrated, especially during November when, with a rainfall of 63·09 inches in one month, negligible damage was experienced as compared with other cultivated patches in the same area.

IV. EXPERIMENTAL WORK.

1. Union Station.

1. *Manurial trial with Budded Limes.*

This trial was suspended in 1936 in order to provide the Citrus Pests Entomologist with a convenient area for his experimental work; a summary of this work has been prepared by Mr. Fennah and is included in the section of this Report dealing with Entomological Investigations.

The trees have continued to show improvement, and a crop of 127 barrels was picked during the year; expenditure, including cost of work done for the Entomologist, amounted to £46 3 7.

2. *Withertip Disease Trials with Budded Limes.*

These trials also had to be held in abeyance owing to the use of this area by the Entomologist for his investigations. Growth in this section was entirely satisfactory, the crop for the year being 21 barrels; expenditure amounted to £20 14 3.

3. *Demonstration Orchards.*

This experiment commenced in 1931, when 1-acre plots each of oranges, grapefruit, avocado pears and grafted mangoes were planted with the object of (a) demonstrating correct methods of planting, cultivating, draining, development and general attention, and (b) ascertaining the economic possibilities under proper conditions as described above. The individual plots are dealt with in detail below:—

Plot 1. Oranges.

Varieties:—Washington Navel, Late Valencia, Parson Brown and Temple.

The beneficial results of the redraining and general cultivation done during 1937 were reflected in the general good growth of all trees in this plot. Cropping was good, the May—June flowering giving an excellent "set", and all fruit found a ready sale locally. The Parson Brown was the best yielder, followed by Washington Navel and Temple respectively; the Late Valencia, as in 1937, was again not up to the standard of the other varieties.

Scale insects were rather more prevalent than in 1937, and birds caused losses of early maturing fruit: poison baits again had to be used in order to minimise these losses. Rustmite damage was fairly severe.

Indigofera endecaphylla soon re-established itself as a ground cover, and lemon grass was grown between the double drains for mulching purposes. All trees received lime, pen manure and two doses of a complete fertiliser during the year.

Expenditure on this plot amounted to £17 18 8; a crop of 9,670 oranges was reaped valued at £13 9 0; together with 37 bunches of bananas valued at 18*s.* 6*d.*; the value of total receipts was thus £14 7 6.

Plot II. Grapefruit.

Varieties:—Marsh Seedless and Duncan.

This plot also benefited from redraining, and good growth was made. A fine crop was reaped in the early months of the year, and the mid-year flowering promised an equally fine crop for 1938–39 picking; the very wet conditions during the latter months of the year, however, adversely affected the trees, and a fair amount of young fruit was shed.

An interesting discovery, made during 1937, was further confirmed with the 1938 crop: One tree in the Duncan section has, over two crops, exhibited marked seedlessness, averaging around 3 seeds per fruit; all the trees in this section were originally propagated from budwood taken from trees introduced from Florida in 1938, but a search through the survivors of these Florida trees has not yielded any seedless fruit. A few plants have been propagated from this "seedless" tree, and budwood has also been sent to the Department of Agriculture, Dominica, for trial in that island.

Two applications of a complete fertiliser were applied during the year, together with pen manure and the usual dry weather mulching; an excellent cover of *Indigofera* was maintained.

Expenditure in this plot amounted to £14 10 5, the value of the crop, sold locally, being £22 5 0.

Plot III. Avocados.

Varieties. Nimlioh, St. Ann, Fuerte, Government House seedling, Government Office seedling and Galvana.

Six more trees died during the year, and it is realised that nothing further can be expected of the remainder; cropping was almost negligible.

Maize and Cavendish bananas were grown as intercrops, and part of the area was planted with papaw from imported seed. No fertilisers were applied in this plot.

Expenditure amounted to £20 8 10, the value of produce reaped being £12 0 0.

Plot IV. Mangoes.

Varieties. Grafted Julie, Budded Julie, Mon Repos late, Ressource late (both of these being local selections of Julie) and Peach.

The trees made fair growth, though the drainage in this plot still needs improvement as shown by the condition of the soil during the wet months; cropping was very disappointing, the Peach variety being particularly poor; this variety also seems easily damaged by wind, the branches snapping readily as compared with the Julie.

Indigofera was further extended, and each tree received one application of a complete fertiliser during the year.

Expenditure on this plot was £2 19 0, receipts being valued at £3 1 4.

V. EXPERIMENTAL WORK OUTSIDE THE DEPARTMENT.

1. *Sugar Cane Manurial Experiment.*

One manurial trial with sugar cane was reaped as a first ratoon at Roseau Estate; details of this experiment are as follows :—

Estate :— Roseau.
Field :— Jardin Negre.
Layout :— Three 4 × 4 Latin Squares.
Variety :— B.H. 10(12).
Plot Size :— Approximately 1/26th acre.
Planted :— Mid-October, 1935.
Reaped as Plant Cane :— April, 1937.
Reaped as First Ratoon :— April, 1938.

Basal treatments :—

Ground limestone 3 tons per acre.
Pen Manure 15 tons per acre.
Sulphate of Ammonia 1 cwt. per acre.

Experimental treatments :—

A. Nil.
B. 2 cwt. Sulphate of Potash per acre.
C. 1 cwt. Superphosphate „ „
D. (2 cwt. Sulphate of Potash) per acre.
(1 „ Superphosphate) „ „

Date of Application :—

Basal treatments in mid-November, 1935.
Experimental treatments (Plant canes) ending November, 1935.
Experimental treatments (First Ratoons) mid-June, 1937.

Results :

——	A 3110	B 3132	C 3046	D 3239	Mean.
Tons per acre ...	36·09	36·35	35·35	37·59	36·35
Per cent. of mean ...	99·28	100·00	97·25	103·41	100·00

Each yield in the above table is the mean of 12 plots. In order to be significant with a 20·1 probability, a difference between any two mean yields of 2·36 tons is required. The results, therefore, under the conditions of this experiment, are not significant.

The total yields of plant cane and first ratoons are recorded below :—

——	A.	B.	C.	D.	Mean.
Tons per acre ...	76·70	73·20	76·74	77·54	77·04
Per cent. of mean ...	99·55	95·02	99·61	100·64	100·00

2. *Sugar Cane Variety Experiment.*

One variety trial was reaped as a first ratoon at Vieux-Fort; the following details are presented :—

Estate :— Point Sable.
Field :— Moulin.
Plot Size :— Approximately 1/30th acre.
Layout :— Four 3 × 3 Latin Squares.
Planted :— Mid-October, 1935.
Reaped as Plant Cane :— April, 1937.
Reaped as First Ratoons :— April, 1938.
Manurial treatment (Plant Cane) :— Approximately ten tons pen manure and 3 cwts. Sulphate of Ammonia per acre.
Manurial treatment (Ratoons) : 2 cwts. Sulphate of Ammonia per acre.
Irrigation :— Ratoons partly irrigated in dry season 1937.
Varieties :— B. 2935
S.C. 12/4
B. 726

Notes :— The ratoons suffered fairly severely during the protracted dry season of 1937 in spite of sporadic irrigation, and growth was further hampered owing to the almost complete suspension of cultivation as a result of the decision to cease sugar growing operations in this area; the following observations were made during reaping :—

B. 2935 :—Few canes per stool, but canes "full" and of good weight; markedly more vigorous than the other two varieties.

S.C. 12/4 :—Approximately the same number of canes per stool but some completely dry.

B. 726 :—Fewer canes per stool but canes compare with those of B. 2935; some tendency to drying out.

Results :—

	Tons Cane per Acre.		
Variety.	Plant Cane 1935-37.	1st Ratoon 1937-38.	Total 1935-38.
B. 2935 ...	37·26	21·50	58·76
S.C. 12/4 ...	31·55	16·62	48·17
B. 726 ...	30·20	16·89	47·09

From the foregoing results, it has been established that B. 2935 is significantly better than the other two varieties both as first ratoons and also in total yield over two crops. No significant difference appears in the yields of S.C. 12/4 and B. 726.

VI. ENTOMOLOGICAL INVESTIGATIONS.

(a) Sugar-cane Moth Borer (Diatraea Spp.).

Mr. H. E. Box, F.R.E.S., Entomologist (C.D.F.), Antigua, visited St. Lucia during March—April, 1938, for the purpose of determining the present status of the Amazon Fly (*Metagonistylum minense*) in the Colony. The results of this survey, according to a report* subsequently issued by Mr. Box, indicate that the parasite is thoroughly established at all four of the

* Observations on Sugar-cane Moth Borers (*Diatraea spp.*) in St. Lucia—III. Report upon a visit to St. Lucia, March—April, 1938 by Harold E. Box, F.R.E.S., Entomologist (C.D.F.) Antigua, Govt. Printing Office, Castries, Sept. 1938.

main sugar-cane centres, attacking on the average 40% of all *saccharalis* in the wetter districts, but less in the drier districts. In fields where *saccharalis* is abundant, parasitism frequently exceeds 50%, and may reach up to 75% occasionally. The fly has spread unaided considerable distances to several other districts, and, except for a small belt between Soufrière and Choiseul, on the leeward coast, where no recoveries were made, the whole Island may be considered colonised.

The present infestation of canes by moth borers is about half of that prevailing before the introduction of the parasite. It must be borne in mind, however, that the infestation figures include the whole of the *cannella* infestation in each year, and therefore the real benefits, due to the reduction of *saccharalis*, are partially obscured.

(b) Citrus Weevil (Diaprepes spp.)

The following condensed report covering investigations during the year under review has been kindly supplied by the Citrus Pests Entomologist, Mr. R. G. Fennah, M.A., A.I.C.T.A., F.R.E.S. :—

The problems to which attention has principally been devoted during the year are those of damage caused by citrus weevils, and the dying out of seedling limes from the so-called "Red root Disease".

In general, infestation of citrus roots by weevil larvae has been lighter in the past season than in previous years, and the extent of current damage was concomitantly less. The incidence was assessed by egg-mass samples during the oviposition season, and by digging beneath trees in the ensuing months. The appearance of the above ground portions of the trees is only of general corroborative value in such assessment, as heavy root infestation is sometimes offset by vigorous root recovery. The trend of oviposition throughout the Island in 1938 has been distinctly different from that of 1937. Briefly, the abundance of egg-masses in each area increased between May 7th and the 2nd or 3rd week in June, then abruptly declined in all parts to a very low figure.

An examination was made of the agricultural aspects of the "bare-root" method of tree protection. In a previous report (1937) it was claimed that the advantages of this method were that it (1) prevents weevil larvae from gaining access to the most vulnerable part of the tree, (2) lessens the risk of injury to the collar arising from careless use of implements, (3) promotes root development of desirable shape and (4) assists planters to decide by scrutinising the upper part of the root system, what trees are worth keeping and what should be discarded. It remained to be discovered (a) whether the practice was likely permanently to lessen the stability of trees in the ground, (b) whether the presence of a hollow "basin" below the tree would lead to water-logging, or (c) whether the removal of soil and exposure of the root system would induce rapid drying out of the roots in the dry season.

Concerning (a) it can be stated that experiments in which bare-rooting was carried to an abnormal extent on (1) nine year old trees (in Montserrat), (2) five year old trees (at Union Experimental Station) and one to one and a half year old trees (at Soufrière), uniformly gave the result that such exposure did not affect stability. To meet the possibility of water-logging it was suggested that a small channel be cut from the centre of the basin beneath the tree, leading towards a drain. On the basis of 16 months experience of the bare-root method under field conditions it can be affirmed that even if no drain is cut, water-logging, or even the temporary formation of a pool, does not occur. This point was critically tested during the heavy rainfall in the latter part of 1938.

The possibility of drying out was investigated both on the material used for investigating (a) above and also, in Soufrière on young material which was given the following after treatments. (1) A heavy mulch of banana leaves, *Crotalaria* etc., (2) a normal mulch, and (3) no mulch. Conditions in St. Lucia and Montserrat during March to May were of suitably low humidity to impose an exacting test, (this was specially severe on parallel material in Montserrat). The soil over which the experimental trees were distributed ranged from a rather heavy loam to one of 78% sand. It was found that all the trees, irrespective of soil and after treatment, remained as vigorous as untreated trees in the same fields, and at no time gave the slightest indication of physiological inferiority.

During the year the cover crop *Tephrosia candida* which is avoided by citrus weevils, and materially assists the growth of trees among which it is planted, has been distributed for general use by the Department of Agriculture. It may be recalled that in 1937 this plant was the subject of a series of experiments in which its repellent effect on citrus weevils was established.

It was noted in an early report that the larvæ of Citrus Weevils are not readily drowned. Experiments were made to determine under what conditions drowning could be brought about so that some estimate could be made of how far they could be approximated in the field. It is sufficient here to state that total immersion of larvæ in de-oxygenated water for a period of 24 hours failed to bring about death, and it was clear that flooding fields with water can be of no practical value in destroying larvæ. In an experiment in which the surface tension of boiled water was reduced by the addition of soap it was found that death of larvæ occurred in 36 hours. It is possible that a small measure of protection can be given to garden ornamentals, such as rose trees, by liberal applications of soapy water around the roots.

During the oviposition season the parasitism of eggs by local parasites (*Tetrastichus* and *Ufens* spp.), has risen to over 60 per cent. by the end of the first week in July. This is in marked contrast to records from 1935 onwards, and it is more in concordance with the percentages recorded in Dominica and Montserrat. Evidence that parasites in St. Lucia, are carried from one oviposition season to another on occasional egg-masses of *Diaprepes* laid out of season has been secured at Dennery Citrus Nursery where egg-masses parasitised to 18 per cent. by *Tetrastichus* were obtainable during the usual non-laying period of *Diaprepes*, and at Soufrière, where a single egg-mass completely parasitised by *Ufens* was found in December. In Dominica and Montserrat surveys of parasitism have consistently shown a superior infestation by *Tetrastichus marylandensis* over other forms (including the spp. found in St. Lucia), though, as with all these egg parasites the difference in parasitism (per cent. total eggs) in different years is considerable. An attempt was made to establish *T. marylandensis* in St. Lucia in July, 1938, material being brought from Dominica. It remains to be seen during the coming season whether this parasite has begun to establish itself.

Dying out of seedling limes has been in progress now for some five years in St. Lucia, and for over ten in Dominica. The method of avoiding this trouble, namely, by using limes budded on to other citrus stocks, was discovered empirically many years ago. The question of the cause of the "Red-root disease", as the condition was properly named was taken up as part of the programme of the Citrus Pests Investigation, after a survey of the incidence of *Sphaerostilbe repens* (a fungus generally considered to be responsible), made by Mr. R. E. D. Baker of the Imperial College of Tropical Agriculture had indicated (and thus corroborated earlier mycological work) that this was not a primary cause, and possibly not even contributory.

Fields surveys were undertaken by the writer in Montserrat, Dominica, and St. Lucia in an endeavour to assess the factors affecting the growth of

the trees. For the soil analyses which were made in the course of this work acknowledgment is due to the Department of Soil Science at the Imperial College. The result showed clearly (1) that the dying out was progressive from the roots upward, and was, in fact, an inverted form of "dieback"; (2) that the direct cause of dying was moving air of (periodical) low humidity, supported by the ancillary soil factors of low maximum water content or marked fluctuation of water content. One of these conditions is usual in (1) soils of high sand content, (2) thin soil overlying sheet rock, or (3) periodically water-logged soil. An examination of the woody tissues (which are invariably affected before the cortical tissues in this type of dying) showed that trees in exposed areas, where dying out had occurred, showed signs of distinctly irregular growth frequently arrested.

The problem was simultaneously approached from the experimental standpoint. Experiments were set up to discover whether the conditions could be (1) produced by artificial means, or (2) transmitted from an affected to a healthy tree. In addition attempts were made to check the condition, where it was seen to be advancing, and to determine how fast the lesion on the bark advances. The experiments in St. Lucia were laid out at Stonefield Estate, by the kind permission of the proprietors, Messrs Leon and Paul Chalon, and to them the writer's fullest thanks are tendered.

In connection with the first point the following experiments were laid down:—(a) A large root on each of five trees was exposed, and deeply gashed with a knife, herring-bone pattern. Four of the mutilated roots were reburied to half their length and the fifth was wholly buried. This treatment may be considered as having reproduced the equivalent of an exceptionally severe attack by citrus weevils on a single root. It was found in June, 1938 that the edges of the wounds had dried, and below them vigorous callus had formed. The exposed wood in the centre of the mutilated part had died, but had not extended below the healthy bark. In other words, mutilation similar to that caused by citrus weevils failed to produce the symptoms found in the trees dying out. (The complete independence of this problem of citrus weevil damage has since become very apparent by the appearance of the trouble in Trinidad, where, as far as is known *Diaprepes* does not occur.) (b) A main root on each of five trees was carefully exposed, being traced out to the extremity. It was then left to dry on the surface of the soil. This was intended to reproduce the conditions arising when all the fibrous roots supplying a main root die.

From all of these exposed roots strip-lesions formed during the dry season, running upwards alongside healthy tissue. The same lack of callus at the junction between dead and living wood, the presence of dead wood ahead of the dead bark, and the presence of extensive gumming in the vessels ahead of the dead wood, in a part where bark was healthy, the absence of any lateral spread of the dead tissue, and its general shape, showed the strip-lesion artificially produced to be identical with the strip-lesion found to be characteristic of trees dying of so-called "Red-root disease." The experimental roots have been demonstrated and material has been preserved.

In connection with the second point the following series of experiments was undertaken.

(c) Twenty inoculations of condida of *Sphaerostilbe repens* were made into the root of as many healthy trees. Ten of these trees were given daily applications of water.

(d) Twenty inoculations of dead wood containing fungus excised from behind the apex of a strip-lesion were made into unaffected branches of lime and two inoculations were made into orange.

(e) Ten inoculations into seedling lime trunks were made using superficial fungus infected tissue from the actual apex of a dying strip of tissue,

and one inoculation was made into orange. Inoculation cuts were also made on the trees, no material being introduced.

(f) Five inoculations were made using wood taken from the dead heartwood of a failing tree, one of these inoculations being made into a root.

(g) A fungus obtained by plating from the dead wood was inoculated into five healthy branches.

(h) Gum spots were found beneath the bark of "bleeding trees", associated with a special parenchymatous reaction tissue. Twenty inoculations were made low on the trunks of healthy trees with this material. (The gum referred to is an almost pearly jelly-like substance, not hard or sticky).

On later inspection it was found that no infection of surrounding tissues had occurred in any of these experiments, and all the cuts had healed over. These results confirmed histological examination, in which it was found that no pathogen constantly occurred in drying tissues. In attempts to prevent the advance of the condition :—

(i) Wood was bared and excised ahead of the dying strips on otherwise vigorous branches, to determine if callus and a permanent sealing of the wood by a gum layer could be induced.

(j) In one tree all the dead wood and the gummed strands ahead of it were gouged out of the trunk. The exposed tissues were coated with paint. Six baskets of manure were applied and the tree was watered every two days.

(k) It was arranged that a group of young seedling trees showing moderately early signs of being affected should be manured and watered during the dry season. This last set of experiments is still being maintained.

Results to date show that (a) during the dry season in which the experiments were laid down relatively little dying took place. On a few trees the strips stopped and callus formed before the point where the cut had been made (and it is certain that the strip-lesion ceased its advance quite independently of the tree surgery), on others the lesion extended. In the early part of the present dry season rather less than half of the experimental trees died, developed extensive dead wood, or showed symptoms of imminent death by heavy fruiting. It was thus clear that such measures as had been taken had proved ineffective in maintaining the water balance of the tree in a satisfactory condition. The result of these experiments agree well with data acquired from ecological investigation and from earlier records, and support the conclusion regarding the nature of the dying-out. It may be added that the speed of advance of a strip-lesion has been found to be about 8 inches a month on some of the experimental trees. It varies considerably according to the degree of aridity to which the tree is exposed, both below and above ground; sometimes it is stopped completely as a result of an improvement in the water balance. On the other hand complete destruction of a tree may occur in scarcely more than a month.

(c) Coconut Pests.

In favourable seasons scale insects have given cause for some alarm on coconut estates, and enquiries have been made regarding the possibility of introducing a suitable parasite to control scale activities. It will therefore be of interest to local estates to learn that action is being taken along these lines in co-operation with Mr. Fennah, Citrus Pests Entomologist. A shipment of Coccinellid beetles (*Cryptognatha nodiceps*; *C. simillima* and *Azya orbigera*)

* This account is intended merely to present the salient features of progress made during the past year. Those who wish to study the experimental work in detail may do so by consulting copies of the six monthly reports distributed by the Advisory Department of the Imperial College, and to be found at the local Department of Agriculture.

which are predacious on scale insects in Trinidad was sent from Trinidad in May, 1937 to combat the Coconut Scale, *Aspidiotus destructor*. Unfortunately, considerable mortality occurred in transit between Trinidad and St. Lucia; the surviving beetles were liberated on coconuts infested with Scale at Union Agricultural Station, but failed to establish themselves. This failure is attributed to the poor condition of the beetles at the time of liberation. Arrangements were subsequently made for further shipments during March/April, 1938, but these did not materialise owing to Mr. Fennah's impending departure on leave. Further shipments are definitely planned for 1939.

(d) Banana Pests.

Bananas have continued free from any major pests.

(e) Coffee Pests.

Some attempt was made early in the year to deal with Coffee Leaf-Miner, which causes considerable damage to coffee, by the introduction of the Leaf-Miner parasite, *Mirax insularis*, from Dominica. The parasites were liberated on young coffee at the Union Agricultural Station, but no recovery of this parasite has been made yet.

(f) Bird Damage to Fruit at Union Agricultural Station.

The following note by Mr. Fennah may be of general interest :—

"Relatively considerable loss of ripening oranges is experienced at the Experimental Station. It was stated that the birds are most active in the early morning and at evening. Baits of 2cc. of 4 per cent. strychnine hydrochlorate were tried. The baits were left out for three days and a number of birds were caught. The species killed included both sexes of the Sucrier (*Coereba martinicana*), St. Lucia Blackbird (*Holoquiscalus inflexirostris*), and the Pere noir (*Loxigilla noctis sclateri*). The numbers of birds seen in the plots during the day was extremely low compared with similar plots in Dominica".

VII. PLANT PATHOLOGY—FUNGOUS DISEASES.

(*a*) *Panama Disease of Bananas.*

The inspection of Banana cultivations in connection with Panama Disease control was carried on satisfactorily during the year, the total number of stools examined being 381,953 in 2,740 old and new gardens; the number of stools infected was 10,825, revealing a percentage infection of 2·86 as compared with 2·47 per cent. in 1937; all cases of disease were treated with gas-oil.

The work of the inspection staff proceeded smoothly until November, when the continuous heavy rains seriously hampered further work; during December, and carrying on into 1939, the inspection staff was also occupied in assessing claims for the Storm Relief Committee.

While the 1938 infection figure of 2·86 per cent. cannot be regarded as unsatisfactory, it is as well to record the probability of a marked increase of Panama Disease in the near future; the continuous flooding of land during November, together with the large number of landslides experienced in the banana gardens must undoubtedly have aided the further spread of the disease; every effort will be made however to locate and deal with newly infected areas as circumstances permit.

Once again must be recorded the thanks of the Department for the helpful co-operation of the planting community with the inspection staff; no enforcement of measures under the Plants Protection Ordinance was necessary.

A detailed analysis of the year's working is given below :—

DISTRIBUTION OF PANAMA DISEASE IN THE COLONY—SURVEY 1938.

New Cultivations (up to 3 years.)

	No. of Gardens.				No. of Stools.			
	Inspected.	Diseased.	Per cent.		Inspected	Diseased.	Per cent.	
			1938	*1937*			*1938*	*1937*
Castries ...	191	103	53·9	28·4	23,595	721	3·0	2·4
Dennery ...	308	212	68·8	30·2	69,071	2,306	3·3	2·8
Micoud ...	422	142	33·6	15·1	70,503	658	0·9	2·5
Soufrière ...	611	223	36·5	22·1	82,210	989	1·2	0·4
Laborie ...	75	33	45·3	...	9,180	209	2·3	...
Canaries ...	27	19	70·4	57·8	5,250	105	2·0	7·3
Anse-la-Raye ...	182	88	48·4	39·0	27,900	1,071	3·8	4·5
	1,816	820	45·2	24·2	287,709	6,059	2·10	2·09

Old Cultivations (over 3 years.)

	No. of Gardens.				No. of Stools.			
	Inspected.	Diseased.	Per cent.		Inspected	Diseased.	Per cent.	
			1938	*1937*			*1938*	*1937*
Castries ...	62	38	61·3	59·4	6,925	142	2·1	5·7
Dennery ...	119	78	65·5	34·4	14,920	760	5·1	1·1
Micoud ...	286	165	57·7	46·3	25,468	945	3·7	4·6
Soufrière ...	272	221	81·3	45·1	21,701	1,633	7·5	4·4
Laborie ...	88	61	69·3	...	11,670	626	5·4	...
Canaries ...	39	31	79·5	92·2	5,960	430	7·2	15·0
Anse-la-Raye ...	58	36	62·0	72·7	7,600	230	3·0	9·5
	924	630	68·2	47·7	94,244	4,766	5·00	3·93

VIII. AGRICULTURAL EDUCATION.

(a) PEASANT ADVISORY SERVICES.

The importance of this work is fully appreciated by the Department and every effort was made to maintain as close contact as possible with the peasant classes in all parts of the Colony. Practical talks followed by demonstrations in the field were a feature of this work.

(b) PUPIL TEACHERS' EXAMINATION IN AGRICULTURE, 1938.

The Agricultural Examination of Probationers and Pupil Teachers was carried out in May; the Examiner's report was as follows :—

The examination was, as usual, conducted in two parts—theoretical and practical—each part carrying a possible total of 50 marks : the results were on the whole better than those of the last examination in 1936 (vide Annual Report for 1936, page 34) but there is still an urgent need for better understanding and knowledge of the theoretical side ; practical work was generally good, and a satisfactory knowledge of routine school garden operations was shown.

Grade	Examined	Half Marks or over	Percentage passes 1938	1936
Probationers	21	10	48	50
1st Year	5	4	80	75
2nd Year	3	3	100	75
3rd Year	4	3	75	60

Of the 33 candidates examined 20 were successful in obtaining the pass mark of 50% or over, a pass percentage of 60.6 (1936—58.6%).

(c) Examination in Agriculture for the Teachers' Certificate, 1938.

This examination was held in August and followed the lines of the Pupil Teachers' Examination reported above, though on a considerably higher standard. The results were satisfactory, nine of the fourteen candidates being successful, a pass list of 64 per cent. It is interesting to record that every candidate satisfied the examiner in the practical test and the majority of this work was of a high standard ; the theoretical papers were well attempted but there was a general lack of expression and observation which suggests that more time could well be made available for general reading in this subject ; an encouraging feature was the marked keenness shown by these candidates a feature not evinced to any degree in the Pupil Teachers' Examination.

(d) Agricultural Instruction in the Primary Schools.

The thirtieth annual examination of the Primary Schools in Agriculture was conducted by the Assistant Agricultural Superintendent and the two Agricultural Officers. As a result of the very abnormal weather experienced during the last quarter of the year and the disastrous landslides which occurred in November, the Department was involved in a considerable amount of relief work which made it impossible to complete examination of many schools at the usual time. This delay meant that majority of the examinations had of necessity to be conducted after the optimum period and a high percentage of absentees was encountered. Moreover the unfavourable weather conditions generally prevailing naturally resulted in some setback to most of the school gardens.

Despite these difficulties however, the general results bear favourable comparison to those of recent years, and the Department continued to render all possible assistance and supervision in this very important branch of primary education.

The report on examinations and general progress in the school garden work is given below. As will be seen a total of 743 pupils (181 of whom were girls) received instruction during the year.

While it is felt that the extent of progress in agriculture in the schools is largely dependent on the attitude of the teaching staff towards this subject, there can be no doubt that the lack of adequate ground in the immediate vicinity of most of the schools for the proper development of the school

garden is also responsible in no small degree for greater advancement not being made. As a medium for ocular demonstration and an opportunity for the school children to show their aptitude for, and interest in, gardening work in a small way, the value of the school garden cannot be over-estimated. One or two extensions have been obtained or promised as a result of the efforts of officers of the Department, and it is hoped to be able to make further progress in this direction during next year.

It has been suggested previously that those schools situated within reasonable distance of the Union Agricultural Station, or other Departmental nurseries, should avail themselves more frequently of the opportunity for visiting the Station or nurseries in order to follow and be shown the seasonal activities. The staff of the Department is only too willing to co-operate by arranging to conduct classes round the nurseries. Two visits were paid to the Union Agricultural Station by local classes during the year, one by the Castries Methodist School and the other by the Forestiere Methodist School. According to the Manager of these schools considerable benefit was derived by the school children from these visits.

EXAMINERS' REPORT ON THE PRIMARY SCHOOLS.

Soufriere R.C. Boys'.

Report: Theory—Very Good. Practice—Good.

Comments: There is much improvement in the theoretical and practical knowledge of this school, and the garden improved in usefulness, since the owners of Soufrière Estate have allowed a plot next the school to be used. Truck crops and ground provision, banana, groundnut and pineapple were cultivated and yielded well. Budding and grafting did not receive sufficient attention. Experiments to demonstrate value of manure, proper cultivation, staking and not staking should be undertaken.

Canaries R.C. Boys'.

Report: Theory—Fair. Practice—Nil.

Comments: Every effort should be made to bring this school into line with others. A plot of ground should be available for a school garden. A district like Canaries should not be without a good garden, and the pupils and teachers should take greater interest in agriculture.

Vieux-Fort R.C. Boys'.

Report: Theory—Very Good. Practice—Very Good.

Comments: During the year such crops as tomatoes, beans, cabbage, carrot and yams were successfully grown. The boys are keen on the vegetative methods of propagation, and several peasants have had their ordinary mango topworked by them. Sugar-cane and Sea Island cotton received attention.

Micoud R.C. Juvenile.

Report: Theory—Fair. Practice—Good.

Comments: Groundnuts and vegetables were successfully grown. Arrangements have been made with the owner of Troumassée Estate for a bigger and better garden, bordering the village. This district needs example and demonstration in the growing of small crops and fruit trees, these are conspicuously absent.

Mon Repos R.C. Juvenile.

Report: Theory—Very Good. Practice—Good.

Comments: Garden crops, pineapple and banana were cultivated during the year. Grafting is being done, but budding practice is lacking. There is quite enough land to extend the garden and the old garden should be given over to orchard plants.

La Ressource R.C. Combined.

Report: Theory—Fair. Practice—Good.

Comments: The VI Standard being absent, the answers were poor. The garden, however, was well worked throughout the year, and good crops of beans, cabbage, lettuce and other vegetables were raised. Sea Island cotton was also in evidence. Sufficient use is not made of green dressing. Anti-erosion methods are a necessity in this hillside garden.

Dennery R.C. Boys'.

Report: Theory—Good. Practice—Very Good.

Comments: Tomatoes, eschalot, corn, yam, mellon, cabbage, carrot, celery and chicory were successfully grown. The garden was severely damaged by the floods and much loss sustained. It is hoped that the land being used by the Agricultural Department as a citrus nursery which will be given up in 1939 will be available for extending the school garden.

Saltibus R.C. Juvenile.

Report: Theory—Good. Practice—Good.

Comments: The school garden though small could be used to greater advantage. While vegetables were grown there was nothing educational in the methods. Budding and grafting should receive greater attention. Topworking on parents' holdings should be practised. A bigger garden should be secured.

Choiseul R.C. Boys'.

Report: Theory—Very Good. Practice—Very Good.

Comments: Local ground provisions, peas, beans, corn, potatoes, cassava, tomatoes and other vegetables were successfully grown. This is a new garden nearly an acre in extent, and is fairly well divided up, one section being devoted to ornamentals and one to medicinal plants, while the orchard section is in the making. Soil conservation methods will be carried out early next year

Riviere Doree Anglican Juvenile.

Report: Theory—Good. Practice—Good.

Comments: This garden is constantly being overrun by animals with the result that only partial success could be obtained from the crops planted. The fencing should be attended to without delay.

Laborie R.C. Boys'.

Report: Theory—Very Good. Practice—Good.

Comments: This garden should be extended as there is room. The soil is not ideal but should be worked to demonstrate methods of improving soils. The crops grown consisted of tomatoes, cabbage, corn, beans, etc. Budding and mango topworking were carried out. A proper layout is contemplated for the coming year.

Gros Islet R.C.

Report: Theory—Fair. Practice—Good.

Comments: The school garden was maintained during the year but owing to adverse weather conditions the only crops which were successfully grown were pumpkins and beans. A few sour orange stocks raised for budding practice are overgrown and should now be replaced by new plantings. The locality being dry and the soil sandy, the application of pen manure or compost and mulching should receive more attention so as to improve the texture and moisture retaining capacity of the soil.

Babonneau R.C.

Report: Theory—Good. Practice—Good.

Comments: The garden was kept in good condition, and crops of yams, dasheens, tannias and beans were grown as well as a few beds of sour orange stocks for budding purposes. The latter were properly cared for and mulched. More attention should, however, be paid to the growing of such crops as lettuce, cabbages, tomatoes, etc. with which the scholars are not so familar.

Forestiere Methodist.

Report: Theory—Very Good. Practice—Very Good.

Comments: This garden is properly laid out and kept in excellent condition. Noticeable features of the garden were the total absence of weeds and the healthy appearance of the crops grown. In addition to the crops of vegetables and beans, Rough Lemon seedlings are being raised for future practice in budding.

Castries R.C. Boys'.

Report: Theory—Good. Practice—Good.

Comments: The garden was kept clean, but sufficient use was not made of the garden; the area now planted being small in proportion to the amount of land available. Crops of ground provisions, beans, tomatoes, cabbages and maize were successfully grown during the year. Questions were answered intelligently and the scholars are taking a keen interest in agriculture.

CASTRIES METHODIST.

Report: Theory—Good. Practice—Very Good.

Comments: This garden, though small, was kept in excellent condition and was successfully cropped with beans, lettuce, cabbages and maize. In addition to these a couple of beds of sour orange stocks were recently planted for budding purposes. Efforts should, however, be made to acquire a larger piece of land for a garden.

CASTRIES ANGLICAN.

Report: Theory—Very Good. Practice—Good.

Comments: Satisfactory work was done in the garden and increased attention paid to drainage, formation and layout of beds, etc. Prior to the heavy rains of November the garden was well cropped, and a variety of vegetables was grown; composting of garden refuse is also being done. A supply of sour orange stocks is needed for budding work. A few young plants have been well looked after.

ANSE-LA-RAYE R.C.

Report: Theory—Good. Practice—Good.

Comments: Flood waters did considerable damage to crops in this garden during the heavy rains of last October and November. During the year the garden was cropped with ground provisions, tomatoes, beans, pineapples, as well as sour orange stocks for budding. The preparation of compost and the mulching of crops are receiving the necessary attention.

LIST OF MARKS.

Schools.	No. absent on Examination Day.	No. of Pupils Examined.	Condition and use made of Garden.	Practical work and Knowledge.	Theoretical Knowledge.	Total.	Percentage.	Result Note.
Possible Marks	—	—	10	10	10	30	100	—
Soufrière R.C. Boys'	62	30	9	8	9	25	83·3	V.G.
Canaries R.C. Juv.	7	15(a)	...	6	6	12	40	W.
Vieux-Fort R.C. Boys'... ...	15	10	8	8	9	25	83·3	V.G.
Micoud R.C. Juv.	8	26(b)	8	6	6	20	66·6	G.
Mon Repos R.C. Juv.	27	35(c)	7	8	9	24	80	V.G.
La Ressource R.C. Combd. ...	32	7(d)	9	4	6	19	63·3	G.
Dennery R.C. Boys'	5	34	8	8	8	24	80	V.G.
Saltibus R.C. Juv.	32	20(e)	7	8	7	22	73·3	G.
Choiseul R.C. Boys'	24	24	9	8	8	25	83·3	V.G.
Riviere Dorée Anglican Juv. ...	20	12(f)	5	7	8	20	66·6	G.
Laborie R.C. Boys'	11	34	7	8	8	23	76·6	V.G.
Gros Islet R.C.	3	14	5	7	6	18	60	V.G.
Babonneau R.C.	19	20(g)	7	8	7	22	73·3	V.G.
Forestiere Methodist	5	12(h)	9	9	8	26	86·6	V.G.
Castries Methodist	6	26	7	8	7	22	73·3	V.G.
Castries R.C. Boys'	6	63	6	7	8	21	70	G.
Castries Anglican	...	57(i)	8	7	8	23	76·6	V.G.
Anse-la-Raye	...	22(j)	7	8	7	22	73·3	V.G.

(a) Including 8 girls; (b) 12 girls; (c) 26 girls; (d) 3 girls; (e) 16 girls; (f) 8 girls; (g) 14 girls; (h) 4 girls; (i) 35 girls; (j) 13 girls.

(e) AGRICULTURAL CADETS.

Three Cadets were in residence at the Agricultural Station, Union, during the year; these comprised the 1937 first-year Cadets who were undergoing their second-year period of training.

The curriculum again followed the lines of previous years, though, owing to shortage of staff there was a considerable reduction in the number of lecture hours, with a possible beneficial increase in the time available for practical work, under the supervision of the Officer-in-Charge or the Foreman of the Station.

The final examination took place in December, the results being as follows—

Name	*Practice*	*Theory*	*Total*	*Per cent.*
Herbert François	83	39	122	61
Andrew Joseph	58	32	90	45
Smedley duBoulay	66	18	84	42

Comments: Practice—Generally good, the standard being considerably higher than usual.

Theory—Poor, mainly owing to inability to express themselves on paper, and no capacity for simple arithmetic.

General—Conduct satisfactory.

IX. PUBLICATIONS, CORRESPONDENCE AND ORGANISATIONS.

An article "An Experiment in the Hand Collection of Egg-masses of Citrus Weevils (*Diaprepes* spp.) in St. Lucia" was prepared by the Acting Agricultural Superintendent and appeared in Tropical Agriculture, Vol. XV. No. 5, May, 1938.

A leaflet dealing with simple Soil-erosion measures for the small land-holder and peasant proprietor was printed for local distribution.

The most important Memoranda prepared during the year were for the West India Royal Commission, which was followed by further evidence given before the Commission during their visit to the Colony from December 17th to 27th, 1938. Memoranda on the Fruit and Vegetable Industry were completed for the Fruit and Vegetable Councils held in Trinidad in 1938. Other Memoranda were prepared for the St. Lucia Banana Association and the Nutrition Committee, and a Report was submitted to Government on the findings and recommendations of the Committee appointed to consider the question of a Peasants' Agricultural Bank. The Acting Agricultural Superintendent was chairman of this Committee. The usual monthly returns were submitted to the Advisory Department of the Imperial College of Tropical Agriculture in Trinidad.

New Books.

New books added to Headquarters Library were as follows:—

Volume 1 Horticultural Colour Chart; Technical Communication No. 36—Erosion and Soil Conservation, by Jacks & Whyte; Soilless Growth of Plants by Carleton Ellis; Soil Erosion, a memorandum by E. Harrison, C.M.G.; Garden Book of Barbados by the Department of Agriculture and Science, Barbados; Preparation of Empire Hides and Skins by J. R. Furlong, Ph.D., A.I.C.; Letters on Soil, addressed to Professor C. Stapledon by G. W. Robinson; Timber its Structure and Properties by H. E. Deach, P.A.S.I., B.Sc., M.A. (Oxon).

A large number of bulletins and reports were received during the year and are gratefully acknowledged. Annual returns and revisions were furnished for the following publications—Blue Book of St. Lucia; West Indian Year Book; Economic Survey of the Colonial Empire; Annual Colonial Report, and other miscellaneous statistics.

211 Minute Papers, 485 incoming letters and 467 outgoing letters were dealt with during the year.

The Agricultural Superintendent was appointed a member of the Nutrition Committee, and the Assistant Agricultural Superintendent was appointed a member of the Board of Education, and the Storm Relief Committee.

The following organisations and committees held meetings during 1938, which were attended by the Agricultural Superintendent or the Assistant Agricultural Superintendent:—

The Board of Agriculture; the St. Lucia Agricultural and Commercial Society; the St. Lucia Limes Association; the St. Lucia Banana Association

and Board of Control; the Land Settlement Committee; the Board of Education; the Peasants' Agricultural Bank Committee; and the Storm Relief Committee.

The Colony was also represented at the First Joint Meeting of the Eastern and Western Group Councils, and at the Third Meeting of the Eastern Group Council held in Trinidad during February, 1938*, the Acting Agricultural Superintendent and Mr. André duBoulay being the official delegates.

STAFF CHANGES.

Mr. E. T. Ward, Dip. Agric. (S. Africa) arrived in the Colony and assumed duty as Agricultural Superintendent & Land Officer as from 5th September.

Mr. G. B. Gregory, Dip. Agric. (I.C.T.A.) Assistant Agricultural Superintendent acted as Agricultural Superintendent from 1st January to 4th September.

Mr. G. M. Glasgow, Agricultural Officer, Class I, continued to act as Assistant Agricultural Superintendent from 1st January to 4th September.

Mr. D. A. Alexander, Agricultural Officer, Class II, resigned his appointment as from 31st May.

Mr. C. M. Alexander was transferred from the Agricultural Department, Dominica, and assumed duty as Agricultural Officer, Class II, from 12th June, vice Mr. D. A. Alexander resigned. He was on sick leave from 1st to 9th December.

Miss Cox, First Clerk and Accountant, was on vacation leave from 1st to 15th January and resigned her appointment as from the 15th January.

Mr. R. Geo. du Boulay, transferred from Vieux-Fort as First Clerk and Accountant on 16th August, vice Miss Cox, resigned. Temporarily transferred to Vieux-Fort as Sub-Collector and District Government Officer etc., from 19th December, 1938 to end of the year.

Mr. R. C. Phillip, Under Clerk acted as First Clerk from 1st January to 15th August, and from 19th to 31st December. Was on vacation leave from 8th to 13th January and from 10th to 31st May.

Mr. N. G. F. Taylor, temporary Copyist, was transferred to the Post Office from 1st August.

Miss C. O. Y. Clauzel was appointed temporary Copyist from 2nd May.

Mr. J. E. D. Osbourne was appointed temporary Copyist, Cold Storage Plant from 1st January. Was on study leave from 10th to 13th January.

OFFICIAL VISITORS.

His Excellency Sir Henry Popham, K.C.M.G., M.B.E., Governor; His Honour A. A. Wright, C.M.G., Administrator; His Honour J. S. Neil, Administrator of Dominica; His Honour G. H. Frith, O.B.E., Acting Administrator; Messrs. G. A. Jones, C.M.G., Dip. Agric., Commissioner of Agriculture; R. E. D. Baker, Mycologist, I.C.T.A.; S. H. Crowdy, Lecturer in Mycology, I.C.T.A.; R. G. Fennah, Entomologist, C.P.I.; C. A. Gomez, Peasants Development Officer, Antigua; H. B. Pidduck, Assistant Agricultural Officer, Dominica; Hon. A. R. Cools-Lartigue, Attorney General; Dr. H. D. Weatherhead, Senior Medical Officer; Capt. H. V. M. Metivier, O.B.E., Senior Veterinary Officer, Trinidad; Lieutenant C. A. Allen, H.M.S. "Dundee"; Sir Edward Stubbs, G.C.M.G., Vice-Chairman, with the following members of the West India Royal Commission: Sir Percy Mackinnon, Mr. H. D. Henderson, and Dr. Mary Blacklock. Dr. S. J. Saint, Director of Agriculture, Barbados; Dr. L. R. Hutson, Veterinary Surgeon, Antigua.

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* Report of the First Joint Meeting of the Eastern and Western Group Councils and of the Third Meeting of the Eastern Group Council, held at the Imperial College of Tropical Agriculture, Trinidad, February, 1938. Government Printer, Trinidad.

SECTION III. FINANCIAL STATEMENT.

Expenditure.

		£	s.	d.
Head XVII.	Agriculture:—			
	Personal Emoluments	1,352	11	6
	Travelling Allowance	312	3	2
	Labour Union and Castries Stations	383	11	7
	Labour Union. Experimental Plots	122	15	11
	Seeds Plants and Manures	147	18	0
	Government Stock Farm	120	16	8
	Miscellaneous Requisites	30	18	9
	Banana Nurseries	88	16	4
	Printing including, Publicity Work and purchase of books ...	11	19	11
	Minor Repairs	18	4	8
	Freight and Transport of Plants	25	4	6
	Panama Disease, Control	178	18	10
	Agricultural Cadets	103	6	7
	Visit of Veterinary Surgeon	24	15	0
	Delegates to Fruit and Vegetable Council	33	13	2
	Agricultural Society—Grant-in-aid	20	0	0
	Citrus Nurseries	259	3	6
	Entomological Service	13	2	6
	Fruit and Vegetable Depot	127	5	3
	Cold Storage Plant	1,073	5	0
		£4,448	10	10
Head XXIII.	Colonial Development Schemes.			
	Schemes—No. 396 Land Settlement	472	10	6
		£4,921	1	4

Revenue.

			£	s.	d.
Head IV.	16	Sales from Agricultural Stations	202	1	0
	17	Sales from Banana Nurseries	34	7	6
	18	Sales of Crates	80	3	9
	19	Fees for Fruit Inspection	68	12	0
Head VII.	1	Government Cold Storage Plant	495	9	9
	2	Government Marketing Depot	76	6	5
X.	1	Instalments sales of lots	2	0	0
			£959	0	5
		Cess on Bananas for 1938	£337	7	5
		Land Settlement Revenue for 1938	£180	8	3

WORK UNDER COLONIAL DEVELOPMENT FUND GRANTS—AGRICULTURAL DEPARTMENT.

The Grant of £9,219 and of a loan of £9,219 at 3½% per annum for 15 years commencing from the 6th year, approved in August, 1933, for the Murray Road & Land Settlement Scheme, was approved during 1937 and considerable progress has been made with the construction of the main access road, the concrete bridge across the Troumassée River having been completed. The modified scheme for settlement was approved during June, 1937, but escheat of the settlement area was not completed until early July, 1938. Survey for sub-division of the area suitable for settlement purposes will commence early in 1939.

SECTION IV. SUMMARY OF LEGISLATION AFFECTING AGRICULTURAL INDUSTRIES AS AT 31ST DECEMBER, 1938.

1. PLANT QUARANTINE.

EXTERNAL—IMPORT PROHIBITIONS.

The introduction of all plant material is regulated under the Plants Protection Ordinance No. 14 of 1916 (Revised), and cognate subordinate legislation. This quarantine work involves the inspection of all seeds, plants, and miscellaneous planting material and containers introduced into the Colony during the year, and is carried on in conjunction with the Post Office and Customs authorities. The introduction of soil, fruit and vegetables is further regulated by legislation under the Customs Amendment Ordinance No. 2 of 1920.

The following schedule gives the position of legislation regulating the importation of material likely to be a means of introducing diseases or pests.

A. *Prohibited articles, including seeds, plants, soil and packages and articles connected therewith.*

Articles Prohibited.	Country of Origin.	Reasons of Prohibition.	Index of Legislation.
1. Plants and Seeds.	Ceylon.	General precautions.	Revised Rules, Chapter 7, Regulation 2.
2. Cacao plants or any parts thereof.	South America, South and East of Panama.	Witchbroom disease.	Revised Rules, Chapter 7, Regulation 2.
3. Banana plants or any parts thereof.	Trinidad, Tobago, Central and South America, Jamaica, Grenada, Canary Islands & West Africa.	Panama disease, root disease and insect pests.	Revised Rules, Chapter 7, Regulation 2. Proclamation of 8.9.17. Proclamation No. 6 of 1925. Proclamation No. 13 of 1925.
4. Coffee, guava, mango, sapodilla, star-apple, plants, fruits, etc.	Bahamas, Ceylon, Cuba, Jamaica, India, Philippines.	Citrus Black Fly.	Proclamation of 10.2.17.
5. All soil, fruit and vegetables, except plantains, nuts, onions, Irish potatoes, canned, candied, dried, or processed fruit and vegetables.	Countries other than the British Isles, Canada and British West Indies. *	Mediterranean Fruit Fly.	Customs Amendment Ordinance No. 2 of 1920—Notice No. 7 of 1930.
6. Cotton seed cake, meal, and other products, Cotton lint, or other parts of the plant, plants or parts of any other malvaceous plants, fertilisers & feeds containing cotton seed meal, baling material, agricultural produce—bags, etc.	Cuba, Haiti, Santo Domingo, United States of America, Mexico, parts of Central America as far South as Costa Rica.	Cotton boll weevil.	Proclamation of 21.8.37. (S.R. & O. No. 33 of 1937).

* A Certificate of Origin is necessary for the non-prohibited countries.

B. *Prohibited articles except under licence and specified provisions.*

Articles Prohibited.	Country of Origin.	Reasons of Prohibition.	Index of Legislation.
1. Sugar-cane, corn, sorghum, fodder, grasses and seeds of grasses. (Natural Order—Graminae).	Any place beyond the limits of the Colony.	Mosaic disease of cane.	Proclamation No. 6 of 1921.
2. Coconuts, Coconut plants, or any parts thereof.	From any place.	Red Ring disease, other diseases.	Proclamation No. 2 of 1924.
3. Cotton seeds, seed cotton.	From any place.	Pink Boll worm, other pests or diseases.	Proclamation No. 3 of 1924.
4. Citrus plants, fruits and any parts thereof.	From any place.	Citrus Canker, citrus black fly, & general precautions.	Proclamation No. 3 of 1927.

C. *Permitted articles, provided these have passed inspection by the Agricultural Department or are otherwise authorised to be imported.*

Articles Permitted.	Country of Origin.	Index of Legislation.
1. Garden seeds, (not including corn, grasses, etc.)	From any place.	Plants Protection Ordinance, No. 14 (1916 Rev.)
2. Plants, root-stocks, nuts, tubers, bulbs, cuttings, etc., free from soil, and not included under "A" and "B".	—	—

II. INTERNAL (a)—EXPORT PROHIBITIONS.

Prohibited Exports.	Destination.	Index of Legislation.
1. Specified Fresh Fruits, nuts and Vegetables e.g. limes, oranges, grapefruit, lemons, mangoes, avocados, papaws, pineapples, bananas, tangerines, mandarines, melons, tomatoes, carrots, string beans, egg-plants, cucumbers, okra, pumpkins, cabbages, peppers, etc., unless under the certificate of the Chief Fruit Inspector.	All countries— *Exceptions:* —West Indies (not Bermuda). —Limes to U.S.A.	Ordinance No. 13 of 1930, Amendment Ordinance No. 1 of 1933, No. 17 of 1933 and No. 3 of 1934. Notice No. 4 of 1930 Order No. 5 of 1930, No. 3 of 1931. Rules No. 6 of 1933 and No. 6 of 1934.
2. Bananas—"Gros Michel" except through St. Lucia Banana Association, or rejected and non-required fruit; and except "Cess" paid 1*d.* per count bunch on above.	To any place.	Ordinance No. 1 of 1934. Amendment Ordinance No. 16 of 1934. No. 11 of 1935. No. 3 of 1936. Regulation No. 20 of 1936.
3. Lime seeds, not in fruit or dried.	To any place.	Notice No. 6 of 1935 (Customs Ordinance No. 109, 1916 Rev.)
4. Agricultural Export products unless specified duty paid.	To any place.	Ordinance No. 11 of 1926. Amendment Ordinance No. 20 of 1926 and No. 9 of 1929.
5. General planting material if notified as not conforming to overseas conditions.	To any place.	Customs Ordinance No. 109, 1916 Rev.: Requires Export certificates to United Kingdom etc.

(b)—CONTROL OF DISEASES AND PESTS WITHIN THE COLONY.

Notifiable Diseases and Pests.	Locality.	Index of Legislation.
1. *Cuscuta spp.* "Dodder".	Generally	Plants Protection Ordinance, No. 14, 1916 Rev. and Amendment Ordinance, No. 3 of 1931.
2. *Loranthaceae spp.* "Bird Vine", Mistletoe.	,,	Proclamation No. 34 of 1919.
3. Coconut Budrot.	,,	Proclamation No. 34 of 1919.
4. Panama disease, Marasmius disease, Banana Borer and Weevil.	,,	Proclamation No. 4 of 1924, Rules No. 8 of 1924, No. 15 of 1924 and No. 15 of 1926.
5. Pink Boll-worm, Cotton Stainer, and Leafblister Mite.	,,	Proclamation No. 4 of 1926.

2. Animal Quarantine.

I. EXTERNAL.—IMPORT PROHIBITIONS.

Prohibited Importation.	Country of Origin.	Reasons.	Index of Legislation.
1. Animals and birds, etc.; Manure, fodder and litter, unless provided with Veterinary Certificate and local inspection certificate.	All places	Prevention of Animal diseases	Ordinance No. 3 of 1935 Notice No. 8 of 1930.
2. Bees or hives.	,,	Prevention of Foul Brood disease	Ordinance No. 18, 1916 Rev. Amendment Ordinance No. 13 of 1928.

II. INTERNAL.—CONTROL OF ANIMAL DISEASES WITHIN THE COLONY.

Notifiable Diseases.	Measures.	Index of Legislation.
Anthrax, Rinderpest, Contagious Pleuro-Pneumonia, Glanders, Epizootic Lymphangitis, Foot-and-Mouth disease, Sheep Pox, Bovine and Caprine Contagious Abortion, Tuberculosis, Swine Fever, Rabies, Mange, Sheep-scab, etc.	Destruction, disinfection, isolation, regulation of movement.	Ordinance No. 3 of 1935.

3. Miscellaneous Legislation affecting Agricultural Industries.

Measure.	Object.	Index of Legislation.
1. Board of Agriculture	Advisory authority on Agricultural matters	Ordinance No. 9 of 1933. Amendment Ordinance No. 27 of 1933.
2. Crown Lands	Land Settlement, Allotment & Sale, Water Reserves, Timber. See also 3 (*b*). (All allotments now require approval of Superintendent of Agriculture).	Ordinance No. 45 of 1916 Rev. Amendment Ordinance No. 17 of 1926.
3. *Protection.*		
(*a*) Minor Products Protection	Prevention of Praedial Larceny	Ordinance No. 13 of 1916 Rev. Amendment Ordinance No. 15 of 1923 and Criminal Code, 1920.
(*b*) Timber Protection	Regulation of Deforestation	Ordinance No. 22 of 1918.
(*c*) Turtle & Fish	Close Season	Ordinance No. 19 of 1916 Rev.
(*d*) Wild Birds Protection	Close Season; Licences to Export	Ordinance No. 20 of 1916 Rev.
4. Labour conditions	Provision for the Employment of persons affected by any physical injury or other cause at less than the minimum rates	Ordinance No. 6 of 1938.
,,	Appointment of a Secretary for Labour	Ordinance No. 14 of 1938.
,,	Abolition of penal clauses; application of contracts between employers & servants	Ordinance No. 29 of 1938.
5. Public Health	Animal-keeping, & sale of animal products	Ordinance No. 17 of 1931. Rules 11 of 1922: 4 of 1935: & Reg. 57 of 1936.
6. Cess of Lime products	Contribution to Entomological service	Ordinance No. 8 of 1937.
7. Sugar Control	To regulate manufacture of sugar in the Colony, the disposal of such sugar, the allocation to local manufactures of quotas for exportation and for sale for local consumption.	Ordinance No. 7 of 1938. Amendment Ordinance No. 22 of 1938.

APPENDIX I.

REPORT ON THE WORK OF THE GOVERNMENT MARKETING DEPOT.

1. Inspection of Export Produce.

The inspection of produce for export as governed by the Fruit Export Legislation (vide Section IV, ii (a) of this Report—Legislation affecting Agricultural Industries—) was continued by the Inspection Staff. The total number of packages inspected amounted to 15,754, and inspection fees collected totalled £68 12 0; the corresponding figures for the five year period 1934—1938 are shown below :—

Year	1934	1935	1936	1937	1938
Packages Inspected	11,872	15,248	14,939	15,037	15,754
Inspection Fees	£48 16 4	£80 11 2	£67 19 8	£65 7 1	£68 12 0

In addition, the inspection and certification of fruit and vegetables for Trinidad was commenced during the year in order to conform to newly enacted legislation in that Colony.

Once again must be recorded the helpful co-operation shown by exporters in this important work. Four licensed packing houses were in operation during the year, in addition to the two sheds under the control of the Depot.

2. Depot Operations.

Continued use was made of the Depot by the smaller exporters, and occasionally by the larger exporters, the volume of work in the Central Packing House showed a definite increase, as indicated by an increase of some 24% in labour expenditure. Products handled were limes, grapefruit, oranges, mangoes, avocados, pineapples, pumpkins, and other miscellaneous vegetables.

(a) Experimental Shipments of Fruit from the Depot.

It was only possible to make one experimental shipment during the year, and this comprised a consignment of 60 lugs of Julie mangoes to a London dealer in August. The results of this shipment were entirely satisfactory, and the following is an abstract of the broker's report thereon :—

"The fruit arrived in a sound hard condition ; packing was satisfactory but it was suggested that smaller boxes of 12, 15 or 18 fruit, with liners of corrugated paper, would be easier to handle and would result in less bruising in transport ; trade was reported as steady for a limited quantity, but with any heavy consignments prices were expected to fall to around one shilling per dozen."

Details of this shipment are as follows :—

Quantity : 60 lugs Julie mangoes.

Shipped : August, 1938, S.S. "Inanda".

Expenditure :

	£	s.	d.
Crates, wraps, etc.	2	4	7
Labour		15	9
Inspection fees		5	0
Cold Storage dues		2	7
Freight	4	10	0
Commission and other London charge ...	6	2	8
Cable		5	0
Total (excluding cost of fruit) ...	£14	5	7

Receipts :

Gross receipts from London	36	9	0
Less total expenses	14	5	7
Net receipts	£22	3	5

Net receipts per lug, exclusive of cost of fruit ... 7*s.* 4·68*d.*

Returns:

Net per fruit (at 30 to the lug)		2·95*d.*
Less cost of fruit at ½*d.*		·50*d.*
Net profit per fruit		2·45*d.*
Net profit per lug	6*s.*	1·68*d.*

Enquiries were made as to the possibility of improving the pack as suggested by the London brokers. It has been decided, during 1939, to make one or more trial shipments in "plum boxes", each holding 4—6 fruit, with 4 boxes to the standard lug.

(b) Depot Finances.

The estimated expenditure for 1938 was £318; actual expenditure was £127 5 3, as shown below:—

	£	*s.*	*d.*
Personal Emoluments	58	0	0
Labour	24	12	2
Part cost of running lorry	15	10	7
Maintenance and equipment	2	5	5
Shipments and Marketing	26	17	1
Total	£127	5	3

In addition to the above, a revolving stock account was operated for the purchase of packing materials. The balance sheet for the year ending 31st December, 1938 is presented below, and shows a credit balance of £39 18 3. (1937—£62 19 1) which was credited to General Revenue. The scale of charges remained unchanged.

Balance Sheet from Valuation of Stock on 31.12.38 at Cost.

Dr. Particulars.	Amount. £	*s.*	*d.*	Cr. Particulars.	Amount. £	*s.*	*d.*
Stock at 1.1.38 ...	193	12	3	Cash sales	328	10	8
Outstanding a/cs. at 1.1.38 ...	14	3	9	Outstanding a/cs. at 31.12.38	6	1	1
Import duty	17	8	7	Collected in 1938 and paid into Treasury in 1939 ...		12	1
Purchases and labour ...	263	10	5	Stock on hand at 31.12.38 ...	194	17	8
Surplus stock at 31.12.38 taken on charge	1	8	3				
Profit	39	18	3				
	£530	1	6		£530	1	6

APPENDIX II.

GOVERNMENT ICE AND COLD STORAGE PLANT.

Continued use was made of the Cold Storage Plant for the precooling of exports and for local cold storage, the revenue derivable under these heads being respectively £11 13 7 and £267 6 6, the corresponding figures for 1937 being £10 13 5 and £193 2 3. Total revenue for the year's working was £495 9 9, an increase of £37 8 10 as compared with the previous year.

The Ice Factory manufactured 132 7/10 tons of ice, the value of ice sales amounting to £206 3 8.

The statement of the working of the Plant for the year 1938 is shown below :—

STATEMENT OF THE WORKING OF THE GOVERNMENT ICE AND COLD STORAGE PLANT FOR 1938.

Dr. Particulars.	Amount. £ s. d.	*Cr.* Particulars.	Amount. £ s. d.
Salaries	204 0 0	Ice sales	206 3 8
Labour and mechanic ...	98 11 2	Rent	6 12 0
Stores and spares ...	105 3 6	Cold storage dues ...	267 6 6
Contingencies	8 0 9	Precooling	11 13 7
Electric power and fuel ...	267 12 10	Battery charging ...	3 14 0
New machinery & installation	339 16 9		
Inspection fee	50 0 0	Total Receipts ...	495 9 9
		Outstandings :—	
		(1) Cold storage dues ...	17 13 8
		(2) Ice sales ...	5 6 10
		Stock on hand :—	
		Ice	12 14 4
		Unused stores (approx.) ...	40 0 0
		(3) Old machinery (approx.)	167 0 0
		Debit balance ...	335 0 5
	£1,073 5 0		£,1073 5 0

(1) £16 11 7 collected and 4*s.* 9*d.* written off to date 1939.
(2) £5 6 10 written off in 1939.
(3) M.P. 1022/1938.

Arrangements made during 1937 for the conversion of the plant to electric drive were completed during the year, and the installation of the new machinery was satisfactorily carried out without undue interference with the normal running schedule; working of the electrified plant commenced on July 1st.

Additional work was done on the improvement of the insulation of the storage rooms, while the final removal of the oil engine plant enabled extensive cleaning and repainting to be accomplished; a new vaporiser coil in the ice tank was also installed.

In spite of the increase in revenue of the plant over 1937 and previous years, the installation of electric drive may be considered a mixed blessing; the advantages of cleaner and cheaper running show signs of being outweighed by the local sales of household refrigerators now made possible by the 24-hour electric service, and the effects of such sales are certain to make themselves felt in the future revenue from ice sales and cold storage dues. In view of this it is probable that the whole question of ice contract and cold storage rates will have to be reconsidered in the near future.

APPENDIX III.

REPORT ON REUNION ESTATE LAND SETTLEMENT, AND CHOISEUL VILLAGE EXTENSION SCHEMES.

(a) Reunion Small-Holdings Scheme.

The total number of lots under this Scheme number 48, one of which was reserved for the Choiseul Village Extension Scheme mentioned below. Of the remaining 47 lots, only one lot remained unsold at the end of year.

(b) Choiseul Village Extension Scheme.

Thirty-seven lots are represented in this Scheme, and at the end of the year 4 lots remained unsold. A sum of £2 12 0 representing annual instalments was collected.

APPENDIX IV.

THE MURRAY ROAD AND LAND SETTLEMENT SCHEMES. (COLONIAL DEVELOPMENT FUND.)

The modified scheme for settlement was approved during June, 1937, but escheat of the settlement area was not completed until early July, 1938. Owing to the shortage of survey staff it was not possible to commence any sub-division work during the remainder of the year, and this was, therefore, left in abeyance until early in 1939. Maintenance of the banana nursery at Quilesse, Panama Disease control, and the prevention of any further squatting and timber cutting formed the principal work to which attention was given.

Expenditure under this head for the year amounted to £472 10 6, and revenue, placed to a Deposit Account for utilisation later on, amounted to £253 2 3, mainly from sale of bananas grown at the Nursery.

Considerable progress was made with the construction of the main access road, which according to the Report of the Colonial Engineer for 1938 had reached mile 4½. The earthworks are two miles ahead of this. A reinforced concrete bridge was built across the Mahaut stream and another similar bridge across the upper Troumassée River.

APPENDIX V.—METEOROLOGICAL OBSERVATIONS.

STATION, CASTRIES, ST. LUCIA, B.W.I.

ht.=3′ 0″ *hr.*=1′ 0″. STATION CASTRIES.

Month.	Rainfall (inches)			Weather.		Wind. No. of Observations. (at 7 a.m., 12 noon, & 5 p.m.)								
	Total	Max.	Date	Days of Rain	Days of Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm
January ...	6·07	1·69	2nd	19	0	—	9	67	11	—	—	—	—	6
February	1.91	·35	11th	13	0	—	13	62	7	—	—	—	—	2
March ...	2·35	·58	6th	15	0	—	1	63	23	—	—	—	—	6
April ...	2.35	·73	18th	10	0	—	—	78	8	—	—	—	—	4
May ...	5·02	1·12	31st	20	0	—	—	81	8	—	—	—	—	4
June ...	12·90	2·23	12th	27	0	—	—	67	21	2	—	—	—	—
July ...	6·34	1·05	31st	22	0	2	1	43	43	4	—	—	—	—
August ...	15·18	2·31	27th	29	0	—	3	53	30	3	—	—	—	4
September	9·57	1·78	23rd	22	0	—	11	46	17	2	1	—	—	13
October ...	11 53	1·52	9th	23	0	1	9	55	9	1	5	—	1	12
November	43·07	5·42	10th	25	0	—	12	37	23	5	5	—	1	7
December	12·61	1·66	18th	25	0	—	12	44	20	6	1	—	1	9
Year ...	128·90	5·42	10th Nov.	250	0	3	71	696	220	23	12	—	3	67

ht.=Height of therm. above the ground in feet. hr.=Height of the rainguage above the ground in feet.

LONGITUDE=60° 59′ 49″ W. LATITUDE=14° 0′ 36″ N. HEIGHT ABOVE MEAN SEA LEVEL=10ft.

Month.	Air Temperature.						Absolute Max. and Min.				Relative Humidity (% Regnault's factor.)		
	7 a.m.	12 noon	5 p.m.	Mean	Means of Max.	Means of Min.	Max.	Date	Min.	Date.	7 a.m.	12 noon	5 p.m.
January ...	70·2	78·5	75·7	74·8	81·8	69·5	87	2nd	74	26th	99	74	82
February ...	69·2	78·8	75·4	74·5	80·5	68·5	86	2nd & 21st	61	23rd	95	70	77
March ...	78·7	79·2	89·6	82·5	83·4	69·2	87	24th	64	5th	86	70	77
April ...	73·5	79·3	80·8	77·9	84·9	70·0	87	13th	67	15th & 16th	86	70	74
May ...	71·4	80·9	78·6	77·0	85·5	70·8	87	*	69	26th & 31st	90	74	78
June ...	74·0	80·8	78 8	77·9	85·4	70·3	87	†	67	13th	93	75	80
July ...	74·5	82·2	79·8	78·8	85·8	70·5	88	17th	69	2nd	93	74	79
August ..	74 6	81·5	79·1	78·4	85·5	70·4	88	‡	68	‖	97	80	83
September	74·0	84·2	80·1	79·4	86·2	72·5	91	12th	70	10th	95	70	80
October ...	73·5	83·8	80·4	79·2	86·2	72 5	90	§	68	28th	95	69	79
November	72·8	80·4	78·2	77·1	82·8	71·2	91	1st	68	¶	95	78	84
December ...	71·4	81·0	77·7	76·7	84 0	70·9	89	25th	67	23rd	97	74	80
Year ...	73·2	80·9	79·5	77·9	84·3	70·5	91	12th Sept. Nov 1st	61	25rd Feb.	93	73	79

* 11th, 16th, 19th, 20th, 22nd, 24th, 25th, 29th & 30th.
† 1st, 2nd, 3rd, 4th, 6th, 8th, 9th, 10th, 11th, 21st, 24th, 26th & 27th.
‡ 11th, 22nd, 25th & 26th.
§ 5th, 14th & 21st.
‖ 9th, 17th & 28th.
¶ 5th, 6th, 16th, 17th, 18th & 22nd.

METEOROLOGICAL CONDITIONS.

Rainfall: The total recorded at the Botanic Gardens, Castries, for the year 1938 was 66·12″ above that of the previous year, and 37·97″ above the average rainfall for 49 years (1890—1938), the average for the 49-year period now being 90·94″ per annum. Maximum precipitation for Castries occurred on November 10th when a total of 5·42″ was recorded. The highest maximum precipitation for the Colony in general was 9·61″ recorded on November 10th at the Barre-de-L'Isle Nursery. Distribution of rainfall was again erratic, although in comparison with the past 49 years' average, the early part of the year was more or less similar. June was higher by some 5 inches, July lower by 5 inches and August higher again by about 5 inches. Thereafter the rainfall followed the average fairly closely until November when it increased by some 35 inches. December was 5 inches higher. This was a record rainfall year registering 7·07 inches in excess of the next highest annual rainfall—that of 1933. It is of interesting contrast to 1937 which was the driest year on record.

Weather: Weather conditions were again abnormal and the heavy rains during October/November resulted in unprecedented storms, floods and landslides during November with disastrous loss of life. Much damage and loss was experienced by flooding in the low lying areas and by landslides and erosion at the higher elevations in all parts of the Colony. Fortunately the southern part of the Island largely escaped the loss and damage suffered elsewhere. Planting operations were seriously retarded.

Temperature: The mean noon shade temperature was 80·9°F., the maximum temperature was 91°F. and the minimum temperature 61°F. an increased range of 30°. Temperatures corresponded fairly closely to those of last year, and September and October were very warm.

Stations: The number of rainfall stations recording during the year increased by three to 39. The thanks of the Department is due to recorders for their continued co-operation.

RAINFALL RETURNS, 1938.

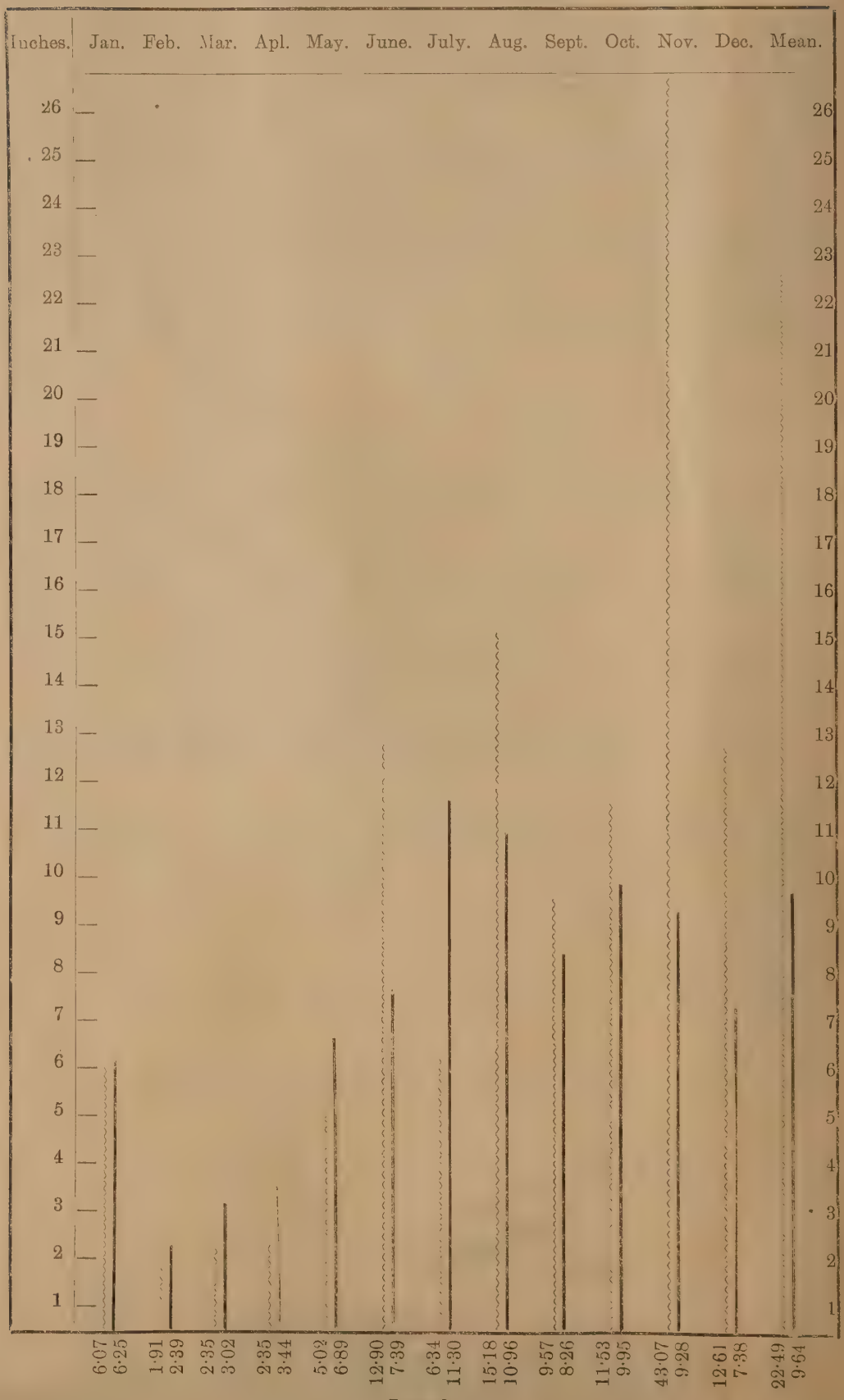
Observation Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Maximum in one day and date.		No. of days of rain.
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.		
Gros Islet, *Reduit Estate	3·03	1·33	...	...	5·70	5·83	...	11·19	6·70	10·97	26·59	5·81	79·85	3·68	15th Nov.	142
Castries, Corinth ,, ...	6·43	1·86	3·04	4·54	6·45	13·03	8·05	18·09	6·19	10·18	42·46	9·58	129·90	7·95	16th Nov.	164
*Marquis Estate ...	5·82	1·45	3·20	5·89	6·00	11·36	8·27	...	8.05	15·84	33·01	...	98·89	6·28	,,	160
†Union Experiment Stn.	6·11	2·69	3·76	4·63	6·36	10·40	8·97	15·91	7·92	14·36	44·86	10·23	136·20	5·52	10th Nov.	288
Choc Estate ...	5·30	2·15	3·09	3·20	5·22	7·68	4·84	14·22	6·76	9·01	37·92	8·55	107 94	4·79	,,	186
†Botanic Gardens ...	5·07	1·91	2·35	2·35	5·02	12·90	6·34	15·18	9·57	11·53	43·07	12·61	128·90	5·42	,,	250
The Barracks, Vigie ...	5·63	1·88	2·65	3·43	5·74	10·14	8 27	15·11	9·05	9·55	35·27	8·07	114·79	5·75	,,	204
Soucis Est., Cul-de-Sac	4·29	1·47	2·05	3·67	7·24	15·11	7·94	16·12	9·88	14·67	40·78	11·25	134·47	6·60	,,	155
Mont D'Or Est., Roseau	5·61	5·48	3·99	2·69	9·82	14·84	8·10	14·30	8·74	13·52	41·41	9·22	137·72	6·34	,,	261
*Belair Estate, ,, ...	5·94	5·19	...	3·29	8·28	11·81	7 89	11·91	7·90	11·75	28·54	6·10	108 60	5·83	,.	252
Vanard ,, ,, ...	6·67	4·97	3·77	3 32	8·59	11 65	8·11	12·37	8·93	16·10	46·83	9·53	140·84	7·00	,,	172
Roseau ,, ,, ...	5·54	4·43	3·82	3·30	9·30	13·55	10·11	12·18	8·71	10·06	29·38	7·77	119·15	4·05	17th Nov.	230
†Barre de l'Isle Nursery	7·32	5·94	2·93	7·18	12·08	13·30	8·64	16 01	12·58	18·31	55·22	13·86	173·37	9·61	10th Nov.	285
Soufrière, La Perle Estate	3·56	3·36	3·91	2·43	8 06	13·10	8·25	14·82	11 40	9·69	17·67	9·26	105·51	3·80	19th Nov.	195
Ruby Estate ...	4·09	3·11	3·63	1·47	10·47	14·31	12·37	13·98	14·86	8·75	17·60	10·44	115·08	4·02	20th Nov.	149
Fonds Doux Estate ...	2·47	2·00	2·77	1·98	10·24	12·10	10·95	12·76	10·92	7·59	19·01	10·04	102·83	3·68	19th Nov.	254
Union Vale ,, ...	1·89	1·18	1·34	1·52	3·11	14·17	8·88	9·64	9·95	4·40	18·73	7·91	82 72	3·54	22nd Nov.	197
Beausejour ,, ...	4·19	2 83	3·50	3 23	13·11	14·82	12·45	14·29	13·04	8·23	23·71	12·01	125·41	3·70	21st Nov.	306
Belle Plaine ,,	4·84	3·45	3·80	3·73	13·21	13·99	12·98	15·49	14·10	10·75	22·85	13·42	132·61	4 52	19th Nov.	314
Rabot Estate ...	3·98	2·82	2·47	2·15	10·92	14 90	12·34	14·55	13·29	8·18	18·39	9·79	113·78	3·10	25th May	272
†Rabot Nursery ...	3·59	2·81	2·64	2·10	9·96	14·07	11·85	14·36	13·55	8·15	17·34	11·28	111·70	3·75	19th Nov.	283
†Quilesse ,, ...	9·79	5·94	9·97	8·84	13·45	17·31	12·37	25·73	25·67	24·52	63·09	24·37	241·05	7·75	10th Nov	327
Choiseul, Morne Lezard Est.	2·54	1·02	1·26	1·37	9·97	13·84	9·50	13·17	7·70	8·44	21·97	9 87	100·65	4·65	20th Nov.	181
Park Estate ...	4·41	1·80	3·27	2·59	11·05	13·01	14·64	12·52	8·87	11·41	24·33	10 81	118·71	4·40	22nd Nov.	261
Woodlands Estate ...	3·83	2 30	3·22	6·12	15·29	16·68	10·65	14·00	19·45	13·43	50·66	12·36	167·99	5·36	19th Nov.	291
Londonderry Estate ...	2·69	1·52	1·44	2·05	9·06	13·27	7·72	11·56	7·52	9·99	25·52	7·23	99·57	3·09	25th May	209
Laborie, Giraud Estate ...	4·10	1·76	2·20	2·98	11·49	15·16	9·47	13·90	9·88	13·14	28·18	10·75	123·01	4·80	21st Nov.	211
*Black Bay Estate ...	2·43	·30	1·42	2·02	...	13·46	10·67	11·41	8·35	11·41	23·24	6·13	90·84	3·28	19th Nov.	164
Vieux-Fort, Retraite Est.	1·77	·85	1·72	2·36	9·37	13·30	14·67	9·84	8·98	9·96	20·62	5·79	99·23	6·40	22nd July	168
Moule-à-Chique ...	1·14	.40	·84	3·01	6·06	9 87	6·66	9·36	8·12	8·55	16 15	4·37	74·53	3 32	26th May	110
Pointe Sable Estate ...	1·56	·40	·72	1·97	8·62	8·98	8·75	12·22	...	..	...	..	43·22	3·65	25th May	63
‡Vieux-Fort Factory ...	...	...	...	...	...	...	..	11·15	5·03	7·68	19·22	5·27	48·35	3·28	28th Aug.	82
Micoud, Troumassée Est.	1·65	·70	1·30	3 40	7·20	14·60	5·40	9·75	5·60	9·05	25·25	9·02	92 92	4·00	5th Nov.	107
Mamiku Estate ...	1·86	1·25	1·84	3·01	5·93	9·85	4·76	10·13	6·70	9·77	19·72	5·86	81 68	3·02	19th Nov.	235
‡Orangerie Estate ...	...	...	...	...	...	...	...	14·04	6·75	15·73	28·59	9·62	74·73	6·50	29th Nov.	134
Dennery, Prospect Est. ...	4·60	3·08	4·15	4·70	7·43	11·49	7·13	14·84	8·48	11·28	35·98	9·92	123·08	4·50	16th Nov.	292
Border Estate ...	2·25	1·88	2·22	3·87	3·57	9·12	7·10	9·99	4·10	4·58	34·17	2·95	85·80	4·56	21st Nov.	280

* Record not complete. † Departmental. ‡ Started in August.

Maxima= Quilesse Nursery. 241·05 | Barre-de-L'Isle Nursery. 9·61—10th Nov. | Quilesse Nursery. 327.

APPENDIX VI.

GRAPH OF MONTHLY RAINFALL—49 YEARS (1890—1938)
CASTRIES, ST. LUCIA, B.W.I.



Legend.

Average for 49 years.

Rainfall during 1938.

REVISED PRICES OF NURSERY PLANTS AND SUPPLIES.

1. The prices of plants do not include the cost of the box or package, for which a charge will be made if not returned to the Department. The cost of delivery is usually included in the prices. Exceptions to this rule will be made at the discretion of the Agricultural Superintendent.

2. All prices specified are for plants of standard quality. The prices of plants not included in this list will be fixed by the Agricultural Superintendent.

3. An addition of 100 per cent. is made on the price of all plants supplied for export from the Colony.

4. No plants are supplied on Public Holidays.

5. At least six months previous notice must be given when large numbers of such plants as bananas, coconuts, coffee, cacao, nutmegs, citrus, cane plants, &c., are required. All such orders should be in writing, and verbal or telephone messages should be confirmed in writing. In default of this rule such orders may not be attended to.

6. All orders will be supplied subject to the discretion of the Agricultural Superintendent and no responsibility is taken in regard to quality or quantity of plants after despatch from the Nurseries.

7. Complaints as to the quality or quantity of plants, &c., supplies, or as to the prices charged, should be made in writing to the Agricultural Superintendent at the time of delivery.

I. PLANTS.

	s.	*d.*	
Banana Plants (sections or suckers)		1	per plant (undelivered).
Oranges Budded		3	per plant.
Oranges Sour		6	per hundred.
Grapefruit Budded		3	per plant.
Lime Plants Budded/Grafted		3	per plant.
Mangoes Budded/Grafted		6	to 1*s.* per plant.
Coffee Plants	1	0	to 2*s.* per hundred.
Cacao Budded		2	per plant.
Nutmegs Grafted		6	per plant.
Avocado Pears		2	to 3*d.* per plant.
Avocado Grafted		2	to 3*d.* per plant.
Cane Plants	1	0	per hundred (undelivered).
Pineapple Plants		1	to 3*d.* per plant.
Eucalyptus	2	0	per hundred.
Casuarina	2	0	per hundred.
Palms (various)		3	per plant.
Ornamental Plants (various)		2	to 1*s.* per plant.
Seeds (various)		2	and 3*d.* per packet.
Plants for windbreaks, hedges, &c., other than the above mentioned	2	0	per hundred.
Grass and Fodder Plants	1	0	to 2*s.* per hundred (undelivered).
Cover Crops and Green Manures		2	per lb.

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